EXPERT ADVICE AND TIPS FOR EVERY AMIGA ENTHUSIAST

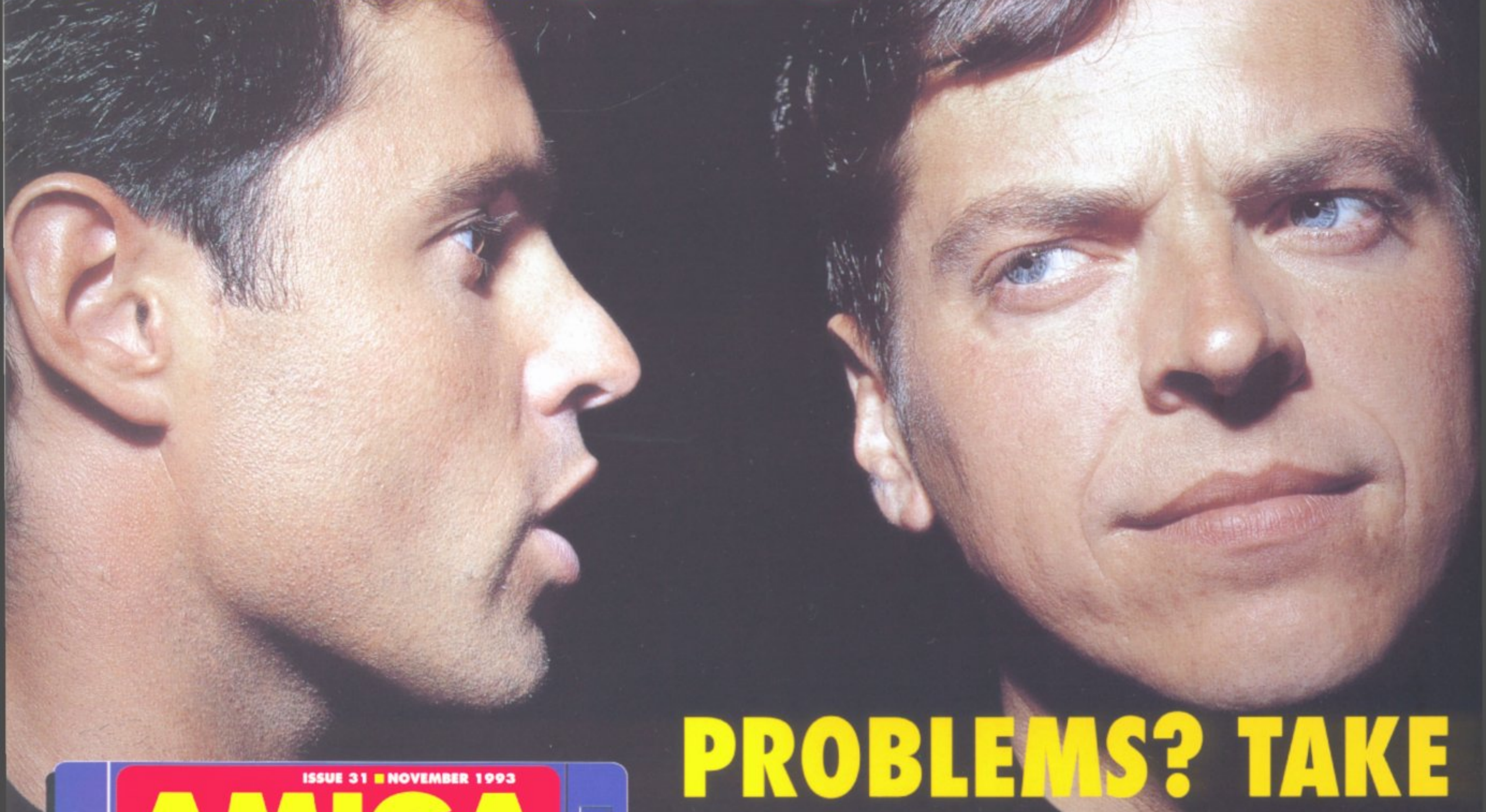
WIN! 10 AMOS PRO COMPILERS

AMIGA SHOPPER

From the makers of AMIGA FORMAT

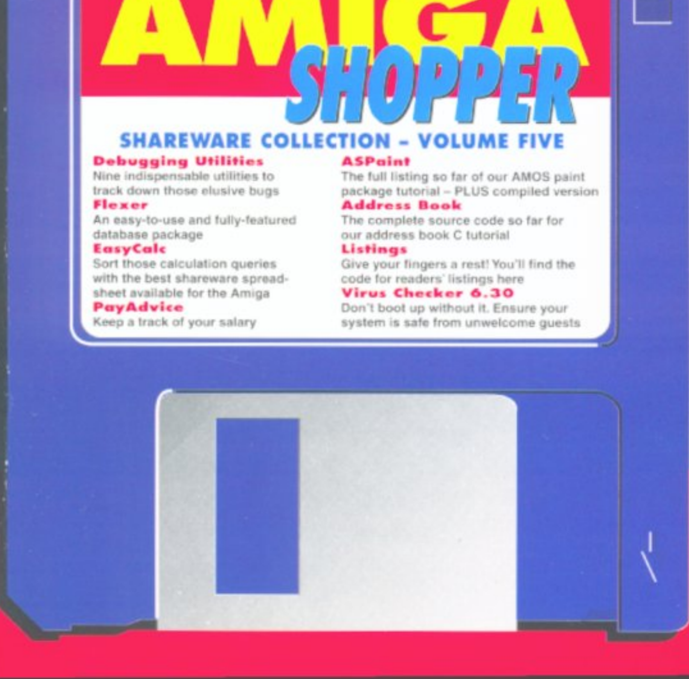
ISSUE 31 ● NOVEMBER 1993 ● £2.95

YOUR DEFINITIVE AMIGA GUIDE



PROBLEMS? TAKE OUR ADVICE...

26 pages packed with solutions to beginners' and experts' problems, ranging from accelerators to video



PLUS Reviews of *Real 3D*, *Quarterback Tools Deluxe* and public domain, tutorials on desktop publishing, music, AMOS, ARexx, AmigaDOS, education, and more

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INDI DIRECT MAIL
Proudly Presents THE JAKKI BRAMBLES COLUMN

Hi, It's been quite a month in the Commodore marketplace, no sooner had we all been told that Commodore had lost their shirt than we have been inundated with masses of good news.

First we have the launch of **two brand new Commodore Amiga 1200 packs** one aimed straight for games market the other firmly at the more mature purchaser. **The Chartbuster Pack** is great value bundled with Nigel Mansell's World Championship race simulator, Trolls AGA and the all time favourite Amiga Challenge Pack. **Desktop Dynamite** reinforces the all round strength of the A1200 with a very powerful package based around Wordworth AGA, Print Manager, Deluxe Paint IV AGA, Oscar AGA and Dennis The Menace AGA.

It's good to see Commodore create such a clear distinction between the Amiga 1200 market and the games console market. soon to be dominated by the Amiga CD32.

As I write this article the first of the CD32's are about to land in the UKwith a promised street date launch of the **first week in September.** The major news around this product is just how many of the softwaRe publishing houses are enthusiastically writing for it and of course that Commodore have decided to bundle 2 great software titles at launch.

Not to be outdone **INDI have added a third** so look foreward to receiving Oscar, Diggers and Lemmings when you take delivery of your New Amiga CD32.

The other item of news from Commodore does appear to be causing somE confusion. It is true that Commodore have appointed the giant **ICL** company to look after the warranty on their products but this only applies to Amiga CD32 and the Desktop Dynamite Pack. All other products and packs previously purchased or yet to be purchased will be covered by Wang.

Finally it was very sad to hear this week of the demise of Diamond Computer a well known advertiser in the Amiga Market. There is no doubt that the recession continues to cause the closure of many companies often without warning. Once again please be careful with your hard earned money and make certain that you follow the code printed in most magazines before you make that special purchase.

See you next month.

Jakki Brambles

AMIGA CD32

FREE SOFTWARE
Lemmings, Oscar, Diggers



The exterior may be sleek but lurking inside the Amiga CD32 is a technological wonder. At it's heart is the mightily powerful 68EC020 processor from Motorola. This contains the 32 - bit technology which has made the Amiga 1200 a runaway success throughout Europe.

Alongside it is Commodore's unique custom AGA (Advanced Graphics Architecture) chipset - comprising three chips nicknamed Paula, Lisa and Alice.

Together they make Amiga CD32 and awesome powerhouse of high speed graphics and stunning sound capabilities.

In fact, the machine can display 256,000 colours on screen (compared to Sega's Mega CD which can only display 64) and has a total colour palette of 16.8 million colours. Amiga CD32 also comes with a chunky 2 Meg of RAM (that's15 times more than Mega CD) and a double speed drive.

SPECIFICATIONS:

* 14 MHZ 68EC020 processor
* 2 Megs 32 - bit chip RAM
* 2 Joystick ports/controller ports
* S- video jack
* Composite video jack
* RF output Jack
* Stereo audio jacks
* Keyboard connector/ auxiliary connector
* Full expansion bus
* Headphone jack
* Headphone volume control
* External brick power supply
* Internal MPEG FMV expansion capability
* Multiple session disc capability

INDI MULTI MEDIA CLUB

A true 'One Stop Shop' for all members. On offer each month with an ever increasing product range , members can obtain software to cover every application including **Morphing, Rendering, Raytracing, Video** and a PD Library second to none. The Club also offers a very comprehensive range of videos including the **Cult Manga Titles, Music, Features and Special Interest**. There really is something to suit every ones taste. Membership costs only £10 and each member receives a quality gift on joining, even though there is absolutely no commitment to buy at any time. If you would like to be a part of this exciting club then call **Indi on 0543 419 999**

INDI IS A MEMBER OF THE DMA

As with most industries, the UK's personal computer industry has its share of cowboys operating in the mail order sector and at the receiving end a line up of despairing consumers who have suffered at their hands.

A personal computer is a sophisticated and expensive item and provided the purchaser is dealing with a reputable and accredited supplier, buying a computer by mail order can be a perfectly safe and cost effective exercise. The Direct Marketing Association (DMA) was set up in April 92 to set and maintain high standards for the sake of the industry and society at large, and to ensure that we can continue to regulate our own activities on the basis of proper professional responsibility.

Membership of the DMA is not conferred lightly - it is a privilege which entails responsibilities, to the consumer as well as to the industry. The foundation for this must be good practice. DMA members are required to abide by the highest standards as laid down in the DMA's code, enforced on members by The Authority of the DMA a separate body with an independent Chairman, and which is an assurance of vigorous self - regulation and professional responsibility. DMA members also agree, as a condition of membership, to abide by The British Code of Advertising Practice and The British Code of Sales Promotion Practice: to apply the Mailing Preference Service file when appropriate: and to subscribe to the Advertising Standards Board of Finance (ASBOF) and to the Mailing Standards Levy as applicable.

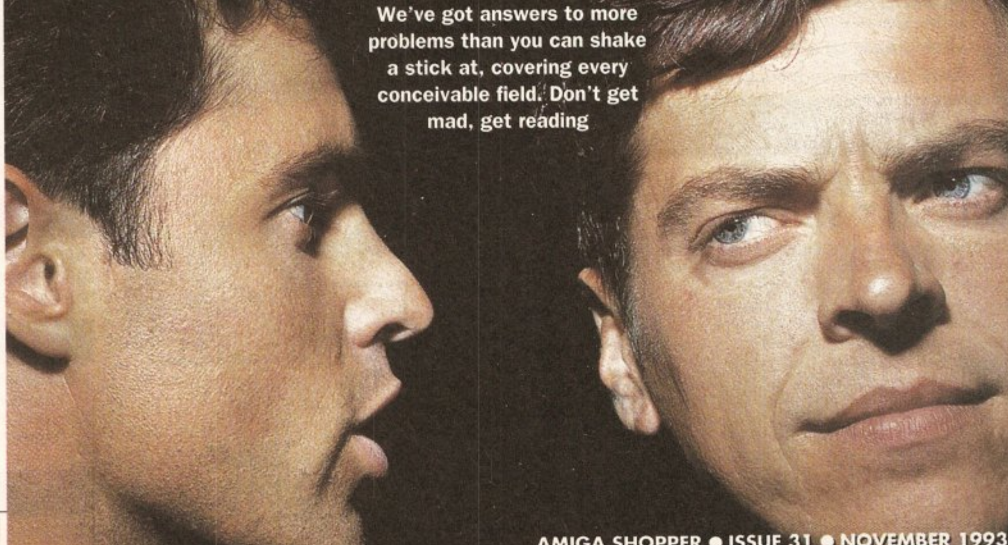
The DMA symbol can only be used by members. Printed on stationary, advertising and other promotional material it demonstrates that these companies conform to the Association's high standards and are subject to the DMA's Code of Practice thus enhancing the companies credibility with customers, suppliers and of greatest importance, the consumer.

Since the symbol was introduced last June, it has become synonymous with quality , professionalism and and responsibility. While it cannot be shown in any way which will become a sign of best industry practice and of strict adherence to DMA codes of conduct. The symbol represents authority for members and reassurance for consumers. It has been a high valued mark of confidence signifying to the consumer the truly professional edge of the industry.

Alison Slan
(Director of Public Relations,DMA)

AMIGA SHOPPER
ISSUE 31 • NOVEMBER 1993

IN THIS ISSUE



CREDIT AVAILABLE ON 6,12, 18, 24, 36 MONTHS.

WHY NOT RING NOW FOR A QUOTE. SAME DAY RESPONSE.

AMIGA PERIPHERALS & ACCESSORIES

NEW FROM MICROBOTICS!!!. M1230XA ACCELERATOR LAUNCH!!

crobotics beats the competition in price/ performance/ features and config-ations. INDI is very pleased to announce the availability of the new 68030 celerator product for the A1200: the microbotics M1230 XA (call it the A" for short). 50 Mhz as standard! Huge 128 MB memory design is stan-rd (the biggest memory space in any A1200 peripheral) just look at these ecifications and prices!

1230 XA W/40 MHZ EC 030 OMB **INDI PRICE £239.99**
1230 XA W/40 MHZ EC 030 4MB **INDI PRICE £369.99**
1230 XA W/40 MHZ EC 030 8MB **INDI PRICE £599.99**
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1230 XA W/50 MHZ MMU 030 8MB **INDI PRICE 6711.99**

MBX1200.

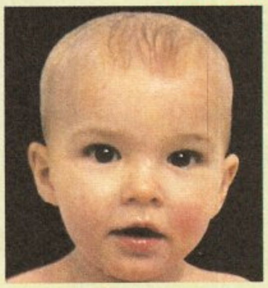
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68882 FPU UPGRADE 50 MHZ **INDI PRICE £169.99**

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INDI PRICE £129.99




AUDIO VISUAL



MEGAMIX. Low cost, hi spec digital effects cartridge plugs into the printer port of the Amiga. Allows stereo sampling from almost any musical source.

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TAKE 2. Animation package is a must foe computer artists and enthusiasts of all ages. As used in Rolf Harris Cartoon Club.

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VIDI AMIGA 12. The ultimate low cost colour digitiser for the Amiga. "The best value full colour digitiser on the market" AMIGA FORMAT.

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ROMBO VIDI AMIGA 24(RT). For the more serious user, this 24 - bit version will again capture from from any video source with true photo realistic images! A staggering 16.7 million colours can be utilised with incredible results. Full AGA chipset support.

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ROCTEC ROCGEN PLUS.
As above but with extra features such as tinting and signal inversion. Allows for real time editing of graphics. Compatible with all Amigas.

INDI PRICE £129.99

ROCTEC ROCKEY.
The ultimate accessory for Amiga / Video fans. Separate RGB controls to chroma key on any colour.

INDI PRICE£249.99

ROMBO VIDI AMIGA 12 (RT). Based on the best selling Vidi Amiga 12. This all new version offers real time colour capture from any video source. Full AGA chipset support as standard for all A1200 / 4000 users.

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Combines powerful tools with an intuitive interface so both professionals and beginners alike can get superb results quickly. New enhancements to the software include the ability to paint and anima in 4696 colours in the Amiga's HAM (Hold and Modify)mode. New animation features also include metamorphosis allowing you to chan one image into another. You determine the number of frames and DPaint IV does the rest.

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ART DEPARTMENT PROFESSIONAL

The ultimate in image processing providing many key benefits to Am users working with pictures.With ADPro you can read, write and co vert between most common image file formats with unmatched flex bility. Full support for JPEG image makes it possible to maintain an image library in full 24 - bit colour without needing massive hard dri storage. Typically a 600 Kb image can be compressed down to 40 K

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Quality: 9 out of10. Exceptional value for money. AMIGA COMPUTING JAN 93



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Commodores original and best selling colour stereo monitor.
Now includes swivel and tilt stand for total ease of use.

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Is a full featured 3D animation, modelling amd rendering program. With Real 3D V2 you can produce high quality images and animatio of three dimensional models with an astonding level of realism. Imag creating an animation that shows a handfull of balls bounce down a flight of stairs to the bottom. Gravity, colliision, deflection and the e ticity of the balls are all automatically calculated by the program!



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AMIGA PERIPHERALS



2MB SMARTCARD. The original and still the only fully PCMCIA compatible memory card for A600/ A1200.Comes with lifetime guarantee. Beware of cheap imitations.
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ZAPPO 601 INC As above only 512K, no clock **INDI PRICE £29.99**



OPAL VISION



NEW FOR OCTOBER RELEASE!

The already acclaimed Opalvision Board takes three further leaps into the future with the official launch of the Opalvision modules. With truly awesome capabilities the Amiga can now become the most professional 24 - bit video graphics power station ever!

The NEW OPAL VISION system(Rev.2)

The amazing Opalvision 24 - bit graphics board and software suite has been updated and is now even better value for money.

The software suite now includes:

Opal Paint V2.0 - Now includes full magic wand implementation and Alpha Channel that allows photo compositing with selectable levels on a pixel by pixel basis.The new Chrominance effect allows absolute, real time control of image contrast, brilliance and re - mapping of colours.

Opal AnimMATE V2.0 - ofering real time play back of animations created by ray tracers, landscape generators, morphers and all other 24 - Bit software.

Opal Hotkey V2.0 - Display OpalVision graphics anytime with key combinations.

Opal Presents - Comprehensive, icon - driven presentation package

Imagine V2.0 Imagine 3D is the most popular 3D rendering software, that now supports OpalVision.This is a full version that would cost £300 if purchaed separately.

"Quite simply, it's a spectacular product - Amiga Computing
"Undoubtedly the finest, most professional paint program to arrive on the Amiga" - *Amiga Format*
"Professonal quality at this Price can't be turned away" - Amiga User International
"The verdict was unanimous - brilliant" - *Amiga Shoppe*

INDI PRICE £599.99

PACK INCLUDES IMAGINE V2.0

SCALA Multimedia 200 (MM200

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With Video Director, anyone with an Amiga, a camcorder and a V can quickly and easily catalogue and edit the best moments from th video tapes. Video Director is extremely easy to use, you can actua control your camcorder and VCR from your Amiga screen . Video Director comes with everything you need to get started. The hard ware to control your camcorder* and VCR is included

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*Camcorder must have a LANC or Control L compatible port

Professional software is imported and sometimes subject delay. Confirm delivery at time of order.

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WHY NOT RING FOR A QUOTE. SAMEDAY RESPONSE. (SEE EXAMPLE)

DIRECT MARKETING ASSOCIATION

Panasonic *Quiet* Colour Printing

We researched the colour printer market at great depth to find a colour printer good enough to cope with Amiga's powerful output, yet at an affordable price.
We found the perfect printer in the KX - P2180 and KX - P2123 quiet printers.
We then considered that if you were going to buy a Panasonic printer you would probably need a quality word processing package to use with it. We found that too, with 'Wordworth' yet at a retail price of £129.99 we thought that might be a little too expensive on top of your printer purchase! So together with Panasonic we decided to give a copy of 'Wordworth' free with every Panasonic printer. How's that for added value?

Panasonic KX - P2180



***WORDWORTH AGA COMPLETELY FREE!**

WITH PANASONIC QUIET PRINTERS. The writers choice. The ultimate word processor for AMIGA computers. Wordworth is undoubtedly the ultimate word / document processor for the full range of AMIGA computers. The graphical nature of WORDWORTH makes producing documents faster and easier, with the enhanced printing fonts (including full Panasonic KX - P2180 and KX - P2123 colour printing support), Collins spell checker and thesaurus, no other word processor comes close. "Without doubt this is one of the best document processors for the AMIGA, Today" (Amiga Format)

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The new Panasonic KX - P2180 9 -pin quiet printer. Produces crisp clear text in mono or in 7 glorious colours with new quiet technology. THe new KX - P2180 is typically 15dBa quieter in operation, than the competition.

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* **Fast Printing** Speeds 192 CPS NLQ
* **Colour Printing** 7 colour palette (blue, red, green, yellow, violet, magenta,black)
* **Quiet printing** Super quiet 45 - 48 dBa sound level (most matrix printers are typically in excess of 60 dBa)
* **6 Resident Fonts** Over 6,100 type styles using Courier Prestige, Bold PS, Roman, Script and Sans Serif Fonts.
* **3 Paper Paths** Paper handling from bottom, top and rear for total flexibility
* **1 Year Warranty** for total peace of mind

Panasonic KX - P2123



The new high performance Panasonic KX - P2123 24 pin. Quiet colour printer offers leading edge quiet printing technology at an affordable price

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* **Fast Printing Speeds** 192 CPS draft, 64 CPS LQ and 32 SLQ.
* **Colour Printing** 7 colour palette (blue, red, green, yellow, violet, magenta, black)
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Panasonic LASER PRINTER

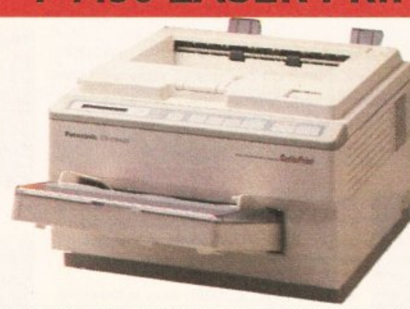
KX - P4410 LASER PRINTER





WORDWORTH AGA COMPLETELY FREEWITH PANASONIC LASER PRINTERS. The writers choice. The ultimate word processor for AMIGA computers NORMAL RRP £129.99 inc VAT

KX - P4430 LASER PRINTER



Once again INDI have joined together with Panasonic to offer all Amiga owners the most outstanding Laser Printer offer ever. We are now able to offer high quality, professional laser printing at affordable prices. We are also giving away a copy of Wordworth with every Panasonic Laser Printer purchased (RRP £129.99). Whether you are looking for a laser printer to handle word processing, DTP, presentation or complex graphic applications - the Panasonic range offers you the power to meet your requirements.

KXP - 4410

* 5 pages per minute
* 28 resident fonts
* Optional 2nd input bin(total printer capacity 2 x 200 sheets)
* Low running costs
* Parallel interface
* Optional memory expansion to 4.5 Mb (0.5 as standard)
* HP laserjet II Emulation

INDI PRICE **£549.99** inc. VAT

Imminent price increase. This price while stocks last.

WORDWORTH AGA COMPLETELY FREE WITH LASER PRINTERS

Panasonic 2 YEAR ON-SITE WARRANTY

KXP - 4430

* Satinprint (optimum resolution technology)*
* 5 Pages per minute
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* 8 Scalable fonts & 28 bitmap functions
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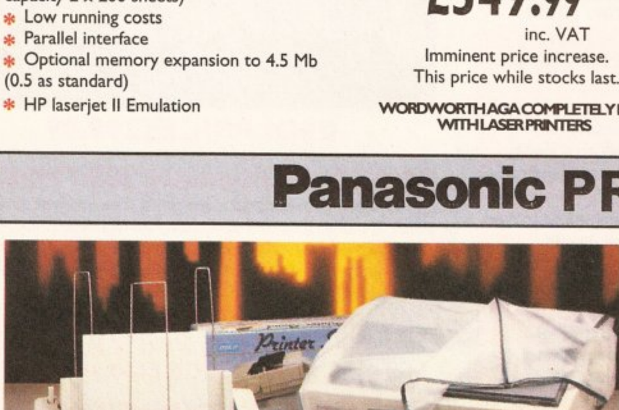
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*(Satinprinters use optimum resolution technology to produce truly outstanding print quality. This software technique smooths away traditional jagged edges on curved characters and lines by varying the printed dot size

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Automatic sheet feeder for KXP 2180/ KXP 2123 holds 80 A4 sheets. **INDI PRICE £89.99**

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Specially tailored quality dust cover for Panasonic KXP 2180/ KXP 2123 printer. **INDI PRICE £8.99**

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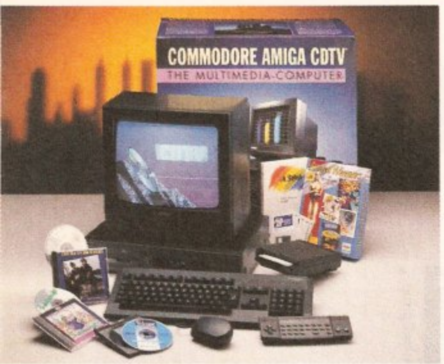
Add £2.50 carriage to all printer accessories or combinations thereof

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At last the CDTV Monitor you have been waiting for. The original and best selling colour/ stereo monitor from Commodore is now available in black to complement your CDTV.

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PACK CONTENTS AS STANDARD

- Amiga CDTV Player
- CDTV Keyboard
- CDTV 1411 3.5" Disk Drive
- CDTV Infra Red Remote Controller
- CDTV Wired mouse
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- Manuals
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INDI PRICE

PACK AS SHOWN £229.99

AMIGA CDTV EXTERNAL HARD DISK DRIVE

You've got the CDTV, you've got the keyboard and the floppy disk drive - for a total computer solution all that's needed is an ultra fast hard disk drive.
The CDTV - HD unit boasts a massive **60 Mb of hard disk** storage with lightning fast access times through its SCSI interface. The unit comes complete with Workbench 1.3 and all necessary cables.

INDI PRICE £219.99

If you are thinking of buying CDTV or already own one you'll be pleased to know that INDI stock all CDTV accessories and software that are available from manufactures. We believe in CDTV and we therefore continue to support this exciting product. You will always have a source of product for your CDTV from INDI.

L to R

CDTV Encore SCSI Controller + Internal Mount	£59.99
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AMIGA 1500

~~RRP £599.99~~

FEATURES INCLUDE:
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- *Includes 2 X 3.5" disk as standard with 5.25 " Disk Bay.
- *Integral memory card and card expansion capabilities (most cost effective expansion route)
- *Workbench 2.00 and kickstart 2.04

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- *Keyboard, mouse, reference manual, Puzznic, Toki, Elf (Games), D Paint III, Home Accounts, The Works(Platinum edition: Wordpro, . Spreadsheet, Database) Joystick.

MONITOR AND PRINTER NOT INCLUDED

NOW £249.99



The AMIGA 3000 Workstation

The Amiga 3000 features the powerful Motorola 68030 processor running at 25Mhz (more powerful than the Amiga 4000/030) with the performance enhancing 68882 co - processor. An idealvideo workstation for the OpalVision system.

FEATURES INCLUDE:
- *68030 processor running at 25Mhz (featuring MMU)
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- *Workbench 2.0 & Amiga Vision Multimedia software

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A2091 CONTROLLER CARD

The 2091A is an autobooting SCSI controller card with the facility to mount the SCSI Hard Drive directly onto the controller card. The 2091A also has the facility to take upto 2Mb RAM (1/2 Mb steps). The A2091A controller is zorro II compatible and is therefore suitable for the Amiga 2000 although it does offer an ideal solution for the Amiga 4000/030, where leading edge performance is not require. The A2091A is still the most reliable Amiga SCSI card available and with the supplied software is the easiest way to install.

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A2630 -2Mb ACCELERATOR BOARD

The 1630 is a 68030 accelerator board running at 25Mhz complete with a 68882 FPU and 2Mb of 32 - Bit fast RAM suitable for the A2000. THe 2630 board brings the performance of the Amiga 2000 upto nearly that of the A3000, ideal when running professional applications. An additional 2Mb of 32 - Bit fast RAM can be added to the 2630 board, giving a total of 4 Mb of fast RAM.

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The A2286 AT emulator kit offers IBM AT compatibility on the Amiga 2000 and 3000 systems, running at 10Mhz with 1Mb RAM and CGA graphics. The A2286 emulator also includes a 5.25"1.2Mb floppy drive and MS DOS operating software.

INDI PRICE £159.99

A2088 XT EMULATOR KIT

The A2088 XT emulator kit offers IBM compatibilityon the Amiga 2000 and 3000 systems, running at 4. 77Mhz with 512Kb RAM and CGA graphics. The A2088 emulator also includes a 5.25" 360K floppy drive and MS DOS operating software.

INDI PRICE £79.99

A2058 RAM BOARD

An 8 Mb 16 - Bit RAM board, supplied with 2Mb RAM and upgradable in two steps. The 2058 is a zorro II compatible and they are compatible with the A2000.

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A cost effective home quality entry level internal genlock, suitable for the Amiga 2000/3000. The 2300 genlock is an ideal solution for anyone wishing to put titles or graphics onto home video.

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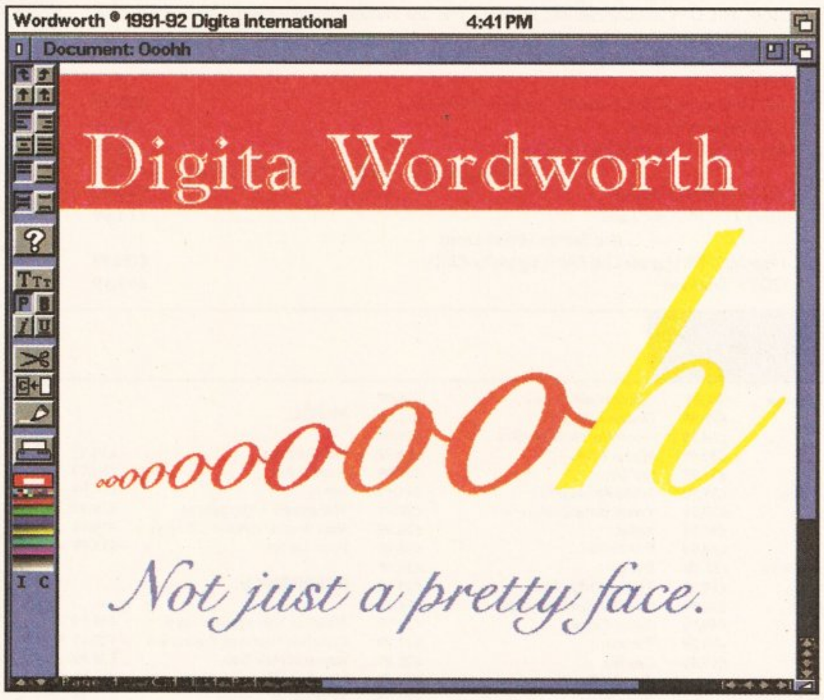
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NEW AGA VERSION

Nine reviewed One winner*



* Word processor roundup, Amiga Shopper, May 1993

(Just thought you'd like to know)

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COMMENT



The editor, Cliff Ramshaw, offers his penny's worth...

Problems – we've all got plenty to be going on with. Things are rarely simple, and this maxim applies very well – perhaps too well – to Amiga usage.

That's why we've decided to remove as many hassles as possible from the time you spend with your Amiga. We've looked at every aspect of computing we could think of and answered a bumper crop of questions on each. We've also supplied answers to the most commonly asked questions in each area. As if that wasn't enough, we've included two special sections on programming – one to guide beginners through the first stages, and one to help you eliminate bugs from your code.

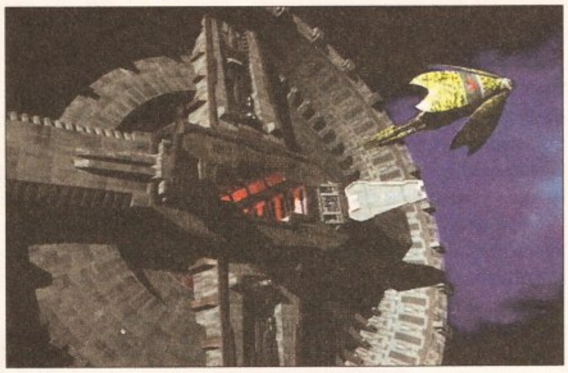
The cover disk is back this month, and it's here to stay for the time being. If you've got a program that might be suitable, send it in to us – we're always on the look-out for original, useful software.

Anyway, enjoy the issue, and keep your comments coming.

Toaster is now your PAL

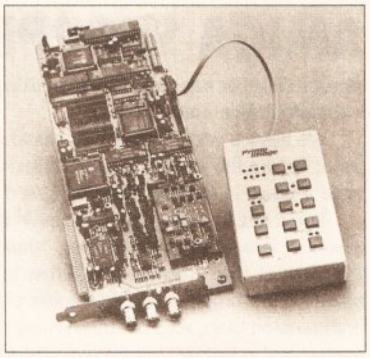
There's light at the end of the tunnel for UK video users who've been waiting for a PAL version of NewTek's famous Video Toaster video effects unit. The illumination is being provided not by NewTek but by Prime Broadcast Equipment, another enterprising States-based video company.

The main stumbling block in using the Video Toaster in this country has been its adherence to the NTSC video standard of America. NTSC pictures are composed of fewer horizontal lines than their PAL counterparts, and run at 60 rather than 50 frames per second. Prime have provided a solution to this problem in the form of a video standards converter. The converter comes as a plug-in card for the Amiga, accepting composite or YC as input and providing the same as output. It will convert from PAL to NTSC, and vice versa.



NewTek's Video Toaster was used to create some stunning 3D images for the American TV show Babylon 5.

The Video Toaster has revolutionised video production in America. Countless TV and film production companies have used it, most recently for the creation of animated storyboards in Steven Spielberg's *Jurassic Park*. The Toaster's ability to create stunning video effects at a price far lower than that of competing systems, combined with its high quality Lightwave 3D modelling software, have made it a firm favourite. For two years UK video users have been waiting for the release of a PAL Toaster. This now seems unlikely, but at least Prime have created some sort of compromise solution.

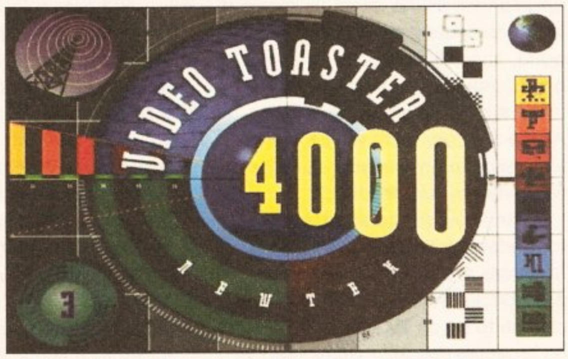


And here's the plug-in converter card that makes PAL toast a possibility.

To make use of the Toaster, you'll need at least two of Prime's converter cards, one to convert your video input into NTSC ready for processing by the Toaster, and another to convert the final output back to PAL. Since the Toaster's speciality is mixing video signals together, you'll more than likely need more converters for each extra video source you want to add.

A typical set-up would require three converters, taking up three of your valuable expansion slots. The Toaster itself takes up your video slot, so things are beginning to look a little crowded inside the Amiga.

A potential problem is that the quality is unlikely to be especially good. We haven't seen it yet, so we can't say for certain, but simple information theory says that reducing the number of lines in a signal from 625 to 525 is bound to result in a loss of information, which is to say a degrading of image quality. We'll be bringing you a review as soon as the converters become available, and then we'll be able to assess whether or not the quality is suitable for broadcast purposes.



Waiting for Godot has proved more productive than waiting for a PAL Toaster – now Prime have filled the gap.

The Prime Image converter and time base corrector cards cost $1,870 each, and are available from Vortex on ☎ 081 579 7105. MicroPACE UK ☎ 0753 551888 will also be distributing them, as well as the Video Toaster itself. You can contact Prime Broadcast Equipment on ☎ 0101 408 867 6519.

Theft!

The clip art that we reviewed in last month's Public Domain World is not in fact public domain but belongs to Artworks. It seems someone had removed the copyright notices from the images and spread them freely.

Having gained the cooperation of the various PD libraries in removing the offending images, Artworks would like to ask them to continue checking their clip art and to notify them if they find any images which they suspect belong to Artworks. They also ask PD houses to ensure their clip art comes from a confirmable source and that a record of the disk's provenance is held. Artworks ☎ 0469 588138.

COMMODORE SWITCH SUPPORT SERVICES

In a surprise move, Commodore have chosen ICL rather than Wang to provide CD32 owners with after-sales service and warranty support.

ICL will become involved in the manufacturing process, as well as providing systems support, warehousing and distribution to customers, distributors and retailers. The company will be fulfilling Commodore's on-site maintenance obligations to customers, and offering them the possibility to extend their warranties further.

Said Commodore's joint managing director Colin Proudfoot, "We wanted to find a way to combine our strengths – innovative technology, sales and marketing – with the best logistics management available.

"We believe ICL is the best. And its service and logistics infrastructure will give customers the best possible back-up."



Commodore's Colin Proudfoot appears on-site with ICL's David Palk. Could this be the end of servicing delays?

Wang, who have come under some flak for delays in the fulfilling of their service contracts, are to carry on providing support to existing owners of Commodore products with on-site warranties. These are primarily A600, A1200 and A4000 owners.

Wang too have an infrastructure which they developed especialy to ensure the highest quality service to Commodore's customers. They stress that the reason ICL rather than themselves were chosen for the CD32 contract was because they could not provide manufacturing and shipping facilities along with their support services.

Free tickets to Future show

We've got 20 free tickets to give away for The Second Future Entertainment Show, a show and a half and no mistake. So if you want to save yourself £6.95, read on.

The show will be running from Thursday 11 to Sunday 14 November at London's Olympia. It follows on from the Future Entertainment Show of last November, which was a storming success by any reckoning.

We ran a full low-down on what to expect at the show last month, but for those of you who missed it, here's a recap. The place will be jam-packed with all the latest happenings in the computing and video games world, and will provide an excellent opportunity for you to meet the movers and shakers. Oh yes, the *Amiga Shopper* team will be there, too, ready to answer your questions and listen to your feedback.

The show will be an ideal place for Christmas shopping, with loads of hardware and software on sale at good prices. And you'll get the chance to be on TV – Channel 4 will be broadcasting their *GamesMaster* show live on the Thursday evening – a first for computer-orientated television. Or, if sound rather than TV is your inclination, Radio One will also be broadcasting live. Another bonus – book a ticket for Friday and you'll also receive a free ticket for a special preview showing of Disney's latest animated spectacular, *Aladdin*.

Tickets must be booked in advance, and cost £6.95 each. A family ticket, which admits four people (of which one must be an adult), costs an entirely reasonable £24.95. You can book by calling the ticket hotline number ☎ 051 356 5085.

But here's your chance to win a ticket for either Thursday or Friday. All you have to do is tell us, in no more than 12 words, why we're so incredibly good to you. The first 20 correct entries win their senders a free ticket. The closing date is Wednesday 13 October. Send your entry (one only, please) to: *You're so brilliant and I want to come to the show for nothing, Amiga Shopper*, 29 Monmouth Street, Bath BA1 2DL. We'll print the names of the winners in the next issue of *Amiga Shopper*, on sale Tuesday 2 November.

More RAM for A1200

Silica systems are to distribute the AmiTek A1200 RAM expansion unit.

The AmiTek board comes bare for £79.95, and has space for up to 8Mb of 32-bit RAM added as SIMMs. The trap-door fitting board includes a battery-backed-up clock, and can have a 68882 maths co-processor fitted, clocked at between 25 and 40MHz. For more details call Silica ☎ 081 309 1111.

IT'S REALLY BRIGHT

Digital Creation's long-awaited paint package, *Brilliance*, is finally ready for sale.

It has been written specifically to take advantage of the AGA modes, and has been written for speed. We'll be carrying a full review next month, but if you can't wait you can contact either Meridian ☎ 081 543 3500 or Micro-PACE ☎ 0753 551211. *Brilliance* costs £199.95.

LOW-COST TRUE COLOUR

True colour displays are within the reach of yet more people with the UK release of Picasso II, the cheapest 24-bit graphics card yet.

Picasso II will fit any Amiga with a Zorro II or III slot and with Workbench 2 or higher. It provides displays in up to 16.7 million colours, and has a maximum resolution of 1,280 x 1,024 pixels with 256 colours.

Its hardware incorporates an on-board blitter, a mouse sprite, and an auto-switch facility which means that only one monitor is needed. Supplied software includes a paint package, an Intuition driver, autoscroll, a re-routing facility for old software and a copy mode for incompatible software. It is supplied with a Retargetable graphics emulator.

Picasso II is being distributed by Micro-PACE ☎ 0753 551211 and sold by, among others, BlitterSoft ☎ 0908 220196 for £299.95.

AMIGA SHOPPER NEEDS YOU!

***Amiga Shopper* has that rarest of things to offer: a full-time job for an Amiga enthusiast who can write!**

We have a vacancy for a technical writer to join our team based in beautiful Bath. To win the job you'll need to know tons about the Amiga, and be able to write it down in a lively, interesting and grammatical style.

You'll get to work in our offices in the centre of Bath, a World Heritage city which is, it is generally reckoned, "dead nice". You will be working as part of the team of four which puts together this magazine every month. As well as being paid "some money", the lucky person gets to join our profit share scheme and pension plan, and will be working for the leading publisher of computer magazines in Britain. Interested? Then write with a CV and examples of Amiga-related writing to Cliff Ramshaw, 30 Monmouth Street, Bath BA1 2BW.

AMIGA IN SPOTLIGHT

There's a show that's being organised by some of the leaders in the Amiga development and retail business. Called Spotlight Amiga, it's taking place at the Novotel Hotel, Hammersmith, London on Sunday 17 October. And we've got 500 tickets for it to give away.

It promises to be a shopper's paradise, with exhibitors providing product demonstrations to interested customers. Among the exhibitors there will be Alpha Data, Amiga Warehouse, Antic Systems, BSC, Compo Software, Computronics, Gasteiner Technologies, Golden Image, Hi-Soft, JAM, Meridian Software, MicroPACE UK, Power Computing, Prima Technologies, Syntronics and 16/32 PD.

If you want to get a free ticket, all you have to do is call the Spotlight Amiga Hotline ☎ 081 885 5098, quoting the reference number AS1, and be among the first 500 callers. Couldn't be easier. If you don't get one, fear not – tickets are available on the door for £1.50.

Printer price war

Two major printer manufacturers, Star and Oki, have announced sweeping price cuts across their non-impact printer ranges.

Both companies are attempting to close the gap between the recommended retail prices of printers and the normally much lower prices at which they sell on the street. Said Steve Hodgson, Oki's product marketing manager for non-impact printers, "These changes will reduce the difference between the RRP and street prices of Oki's 8ppm range. This means that pricing will be much clearer for purchasers."

Star's marketing manager Annette Tarlton had much the same message to give: "By introducing a realistic recommended retail pricing structure to our LS-5 family, we are bringing sanity to the laser printer market. Not only do the new prices reflect more clearly the expected price of a laser printer today, they also offer dealers the chance to be fair to themselves and their customers. As from today, our printers are available at a very competitive RRP that will translate into an equally attractive price to the user."

Oki's new prices are as follows: the OL810 and OL830 drop from £1,761 to £1,173, and the OL850 drops from £2,231 to £1,761. All are LED printers, a technology producing similar results to those of laser printers, but with more durable parts.

Star's laser printers are aimed at a slightly lower-end market, although there is overlap. The LS-5 has been reduced from £997 to £715, the LS-5 EX from £1,232 to £921, and the LS-5 TT from £1,526 to £1,173. The latter includes MicroSoft PostScript support.

Oki ☎ 0753 819819. Star Micronics ☎ 0494 471111.



With a reduction of £353, Star's LS-5 TT is one of many printers having their prices dropped this month.

Commodore's wonderful world

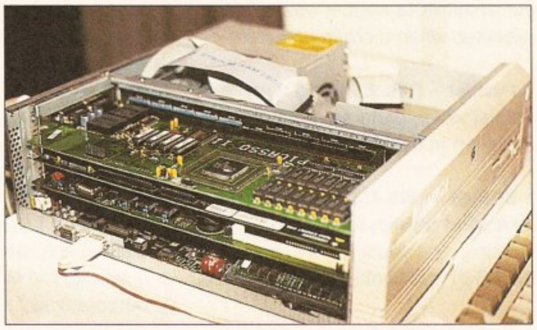
Richard Baguley jets to Pasadena, California for the World Of Commodore Show, and finds that there's plenty to write home about, including a new chipset

American computer shows are somewhat different from British ones. For a start, American shows are much more serious. There are video peripherals galore, but the games are rather thin on the ground. The only ones I could find were on one of the few box-shifter stalls, and this is another place where show-goers get a different deal. Most shows in the UK are dominated by dealers whose intention is to sell as many products as possible in the minimum amount of time. Not that there is anything wrong with that – it's a good opportunity to pick up some bargains. But at an American show you're far more likely to bump into a manufacturer rather than a dealer.

Enough of the jet-set chit chat.... 43 companies were exhibiting at the show, including such luminaries of the Amiga world as GVP, Digital Creations and Commodore themselves. The show was definitely smaller than in previous years, and several companies were noticeable by their absence. Where were Gold Disk and NewTek? Don't know about the former, but Todd Hayes of NewTek said, "We don't want to preach to the converted. We're going to concentrate on other types of show."

The Amiga scene in America is still pretty active. It's heavily dominated by video equipment, with most of the companies present exhibiting something in this area.

Centaur Developments were demonstrating prototypes of the long-awaited OpalVision modules, sadly still not finalised. Centaur were demonstrating the Digital Video Effects that the Roaster Chip, Video Processor and Video Suite are capable of producing. They certainly looked stunning, but it's unlikely you'll be able to use them yourself until December.



Picasso II, a display card with 16.7 million colour capability, was being shown by Expert Services.

Expert Services were showing Picasso II, a 24-bit graphics card with retargettable graphics facilities. This means that any software using the AGA chipset via the Amiga's operating system can be run on an older system fitted with one of these cards. Resolutions of up to 1,280 x 1,024 pixels with 256 colours, or 800 x 600 with 16 million colours, are possible.

Another new video card, the Spectrum, was being shown by GVP. It uses the EGS library standard, taken on board by several manufacturers, which will enable programmers to write software to run without alteration in conjunction with differing graphics cards. Also on display at the GVP stand was version 1.5 of *ImageFX*, which includes support for a number of new file formats.

Scala were showing the latest version of their multimedia software, *Scala MM300*. This includes a wide range of new features and improved interface support for programs and hardware such as The One Stop Music Shop.

Jim Drew on the Utilities Unlimited stand was demonstrating the latest version of the *Emplant* software, although the eagerly-awaited 32-bit clean version (which would enable it to be run on an A4000/030) was nowhere to be seen.

Commodore were definitely in evidence, with a large stand displaying several CD32s. Contrary to what we were previously told, the machine is now to be launched in the USA, although advertising will be on the minimal side.

Video enthusiasts crowded around the Digital Micronics stand to see Digital Broadcaster, a card which digitises video and stores it on to a hard disk. It can then be played back, chopped and changed within the computer for the purposes of editing. The Vivid 24 co-processor was also there, but is still lacking in software support.

On the sound side, Sunrize Industries were demonstrating version 3 of their *Studio 16* hard disk recording and editing software. When used in conjunction with one of their 16-bit sampling cards, it enables you to sample directly to and play sounds back from hard disk.

Away from the hustle and bustle of the stands, seminars were being held. Highlights included Amiga artist Jim Sachs demonstrating the new paint program *Brilliance*, and Amblin imaging animator John Cross demonstrating the how the Toaster 4000 was used in the production of the TV programme *Seaquest*.

Commodre's Vice President of Engineering, Lew Eggebrecht, made the keynote speech, giving a frank appraisal of where Commodore US are, and where they are going. In the US, the main Amiga model is the A4000/040, although the CD32 will be released this year. Most other projects (including networking and the DSP) were dropped in favour of developing the CD32, and Commodore are now looking for third parties to pick them up. Eggebrecht also announced that the AAA chip set has reached the prototype stage (see box-out), and that the A4000-T, which has a SCSI-II interface on the motherboard, will be available later this year.



The tower version of the A4000, complete with on-board SCSI-II interface, was on the Commodore stand

This year's World Of Commodore Show was certainly quieter than last year's, but given that the USA accounts for only 10% of Commodore's sales, this doesn't come as a complete surprise. However, the USA still leads the way for serious applications and hardware, and the frantic activity at the stands here showed that the good old Amiga is far from dead in the USA. AS

AAA CHIPSET NEWS

The Amiga AAA chipset is finally in existence, it was announced at the World of Commodore Show by Lew Eggebrecht, Commodore Vice President of Engineering.

"We've had a very dramatic breakthrough in the last week. We actually have running silicon. The AAA chipset will offer a 10 to 20 times performance increase over the current AGA chips."

The new chipset will be in the next generation of Amigas, which are slated to have their Motorola central processors superseded by much more powerful Reduced Instruction Set Coding processors.

It's unlikely, though, that any Amigas incorporating either of these advances will surface until the middle of next year at the earliest.



The Amiga Shopper Shareware Collection volume V

Gus Chandler brings you all the details of what's on this issue's packed cover disk.

DEBUGGING UTILITIES

Most Workbench 1.3 compatible – see individual utility details

If you have problems in getting your code to work then you'll find that the nine utilities we've supplied this month are an essential aid. To get at these utilities you proceed as shown in the box at the bottom of the page.

The most convenient way to use these utilities is to copy them into the **c:** directory of your Workbench disk. The simplest way to achieve this is to de-archive the software into the RAM disk rather than to a floppy. You can then just copy the files to your **c:** drive by typing the following command in a Shell window:

```
copy ram:#? c:
```

Once you've copied the utilities on to your **c:** directory in this way the commands can simply be called by typing their names in the Shell window. A number of them require a parameter to be specified when you type them in – to check the syntax for each command simply type the command name followed by a space and then a question-mark.

• **Alert – (Wb 1.3)** Your program has just Guru'd out? Well with *Alert* you can check out exactly where in the operating system it decided to "bomb out". Once you've rebooted the system open a Shell window and type **alert** followed by the address specified in the Guru message and you'll get details of where in the system the crash occurred.

• **Eatmem – (Wb 2.0)** *Eatmem* is designed to artificially gobble up memory, which can be useful if you want to simulate out-of-memory errors. It's also handy for testing how a piece of software will perform on a 512K Amiga without ripping out your add-on memory boards.

• **Frags – (Wb 1.3)** Use this command to see just how fragmented your memory has become, so you know when it's time to consider rebooting the system for more efficient operation.

• **Monitor – (Wb 1.3)** A powerful machine code disassembler and debugging package. With it comes a comprehensive document file with full instructions on how to use it.

• **Owner – (Wb1.3)** Use this to find out which ROM routine was being executed when a crash occurred.

• **Portlist – (Wb 1.3)** This command will list which ports are currently assigned in the system port list.

• **Strings – (Wb 1.3)** Use the command **Strings** followed by a filename and you'll get a listing of all the ASCII text contained within a file.

• **Taskpri – (Wb 1.3)** By using the *Taskpri* utility you can change the priority of all the tasks that are currently running on the system.

• **Tstat – (Wb 1.3)** *Tstat* will give you details on the status of the specified task. If you omit a task name then you'll get information on the state of the current CLI – which is itself treated as a task.

• **Vital debugging tips: page 27.**

VIRUS CHECKER v6.30

All Workbenches

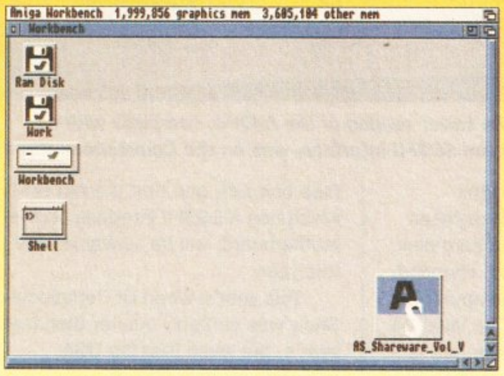
If you're a regular reader of *Amiga Shopper* you'll already have an earlier version of this essential virus hunting and killing utility. However, you'll still want to make sure that you replace it with v6.30 because this contains code to deal with a number of new and virulent little nasties.

Once you've de-archived *Virus Checker* it's simple to install on your system. If you use Workbench 2 or above, just drag the **Virus_Checker** icon into the **WBStartup** drawer. Alternatively, copy the **Virus_Checker** file to your **c:** directory and add this line to your startup-sequence :

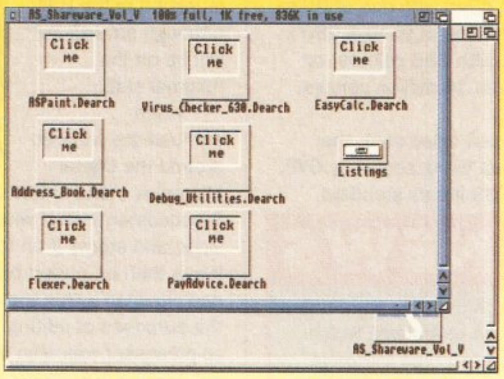
```
c:Virus_Checker
```

With *Virus Checker* you can be sure that no viruses will sneak on to your disks without your knowledge. If *Virus Checker* finds some code it considers suspicious it will let you know and then offer you a series of options as to what to do about it.

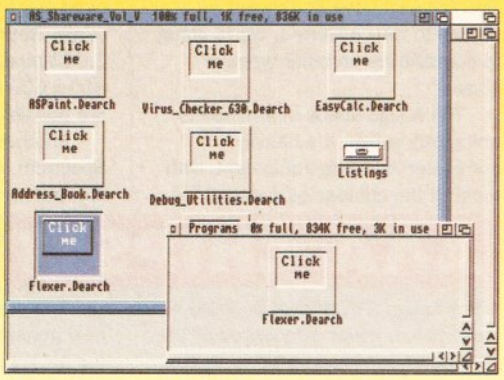
SO JUST HOW DO YOU GET AT ALL THIS



❶ First boot up your Amiga with Workbench. Then insert the *copy* that you've made of the cover disk and wait for the **Amiga Shopper** icon to appear at the bottom right of your screen.



❷ Double-click with the left mouse button on the **Amiga Shopper** icon and a window will then open which contains eight icons. With the exception of the **listings** drawer (which holds the source code for the three AMOS programs on our listings pages), all of the other programs included this month have been compressed with the archiving utility *LhA*. The next steps show how to extract the programs.



❸ Let's assume that you want to extract the *Flexer* package and store the uncompressed programs on an empty formatted disk called **"Programs".** First double-click on your destination disk, **Programs,** to open its window. Then click with the left mouse button on the **Flexer.Dearch** icon and – while still holding down the left button – drag the icon into the **Programs** window.

VITAL: READ THIS FIRST

The first thing that you *must* do with your cover disk is to protect it from accidents by making sure that it is write-protected. To do this, make sure that the movable plastic tab on the disk is in the open position – that is, you can see through the hole. This means nothing can now be written to the disk, especially viruses. If you don't write-protect your disk and end up with a virus – well, that's your problem.

The next important step is to make a back-up copy of the cover disk – in case any nasty accidents happen while you're busy working with it. The easiest way to go about this is via the Shell. So, open a Shell window and then type the following at the prompt:

```
diskcopy df0: to df0:
```

Your Amiga will now ask you to insert the SOURCE disk (that's the cover disk) in **df0:** and then press the [Return] key to continue.

Your computer will now read some of the information from the disk before another System Requester window appears asking you to insert the DESTINATION disk (that's the empty disk you want to make a copy of the cover disk on). You'll find that you need to swap disks several times – a System Requester window will appear each time, prompting you to insert the appropriate disk.

If you have more than one floppy drive, you can of course copy from one drive to the other by using the following instruction:

```
diskcopy df0: to df1:
```

Right, now that you've made a copy of the cover disk, hide the original in a very safe place and work *only* with the duplicate.

CAN'T READ THE DISK?

We duplicate tens of thousands of disks, so inevitably a very small number will be corrupted – our copiers do carry out stringent quality-control tests, but the occasional duff disk will always sneak through. You'll know if this has happened to your cover disk because either you'll get a System Requester window appearing to tell you that you've not got a DOS disk sitting in your drive, or a System Requester will pop up to tell you just as unhelpfully that a READ ERROR has occurred while one of the programs was de-archiving.

The solution is straightforward. Just send the faulty disk to the address below, enclosing an envelope addressed to yourself for the return of your replacement disk – the padded variety are best – and we'll pay the return postage. The address is:.

***Amiga Shopper* 31**
Discopy Labs
PO Box 21
Daventry NN11 5BU

With the disk please include a brief note saying what the problem is. Also mention what Amiga you're using and the version of Workbench that you are running. A replacement disk should then come rattling through your letterbox within a couple of weeks.

FLEXER

All Workbenches

Want a database, but don't feel like splashing out on a commercial package? Then *Flexer* is for you. Written by Andrew Forrest and specially presented on our cover disk, *Flexer* is both a doddle to use and packed with powerful features. Supplied with *Flexer* are a full set of instruction files along with a set of example databases to help you get started quickly. To get *Flexer* up and working just follow the set-by-step guide below.

PAYADVICE

All Workbenches

Can you never find your old pay slips when you need to check your tax, or just want to see exactly how fat the Inland Revenue's slice of your hard-earned cash is? *PayAdvice* is the solution for you. It's an easy-to-use pay analysis program that is easily configured to deal with the way in which deductions are made from your own salary.

To access the software follow our six-step guide – dragging the **PayAdvice.Dearch** icon into the window of a pre-formatted disk and then double-clicking on it.

EASYCALC

Workbench 2 and above

EasyCalc is a powerful spreadsheet package that's extremely easy to use. We reviewed it in *Amiga Shopper* 28, where it rated 9/10.

Again, to access the *EasyCalc* package you'll find it easiest to drag the **EasyCalc.Dearch** icon into the window of a pre-formatted disk and then double-click on it. However, once you've de-archived the package you won't be able to use the software immediately – it needs the **rexxsyslib.library,** which we haven't been able to distribute on the disk for copyright reasons. Don't worry – you already have this library in the **libs:** directory of your Workbench disk. All you have to do is copy it to the **libs:** directory of the disk which you dearchived *EasyCalc* to.

ASPAINT

All Workbenches

Over the last few months our AMOS guru Jason Holborn has been leading you through the development of an AMOS paint package. When you decrunch this archive you'll find Jason's source code so far – which of course you'll need to own AMOS to be able to use. Also included is a compiled version of the code so if you don't have AMOS you'll still be able to see just what *ASPaint* is all about – but remember that it isn't intended to be a complete program yet, so don't expect it to be able to replace *DPaint!*

ADDRESS BOOK

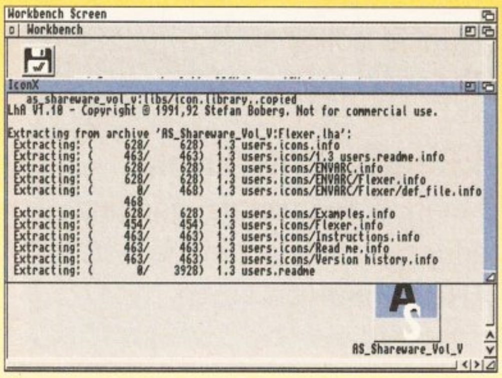
All Workbenches

From Toby Simpson, our resident C expert, the *Address Book* package he's been working through over the past months in *Amiga Shopper.*

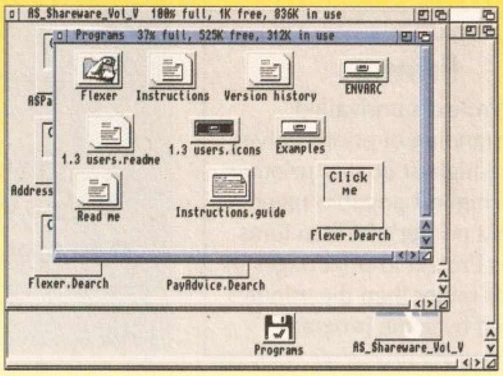
SOURCE CODE

To save your typing finger, here's the full source code for the reader listings on page 63. AS

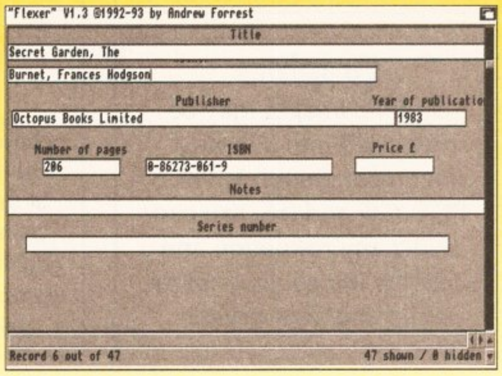
LOVELY SOFTWARE ON YOUR DISK?



4 Now double-click on the **Flexer** icon in the **Programs** window and the *Flexer* package will automatically be uncompressed. While this is happening a window with the title **"IconX"** appears, listing the files as they are decrunched. If you have only one disk drive you will have to swap disks a number of times – a System Requester window will appear each time to tell you when this is necessary.



5 The *Flexer* package is now decrunched but only the original **Flexer.Dearch** icon is displayed. That's because you need to update the window: if you have Workbench 2 and above, select the **Update** option from the **Window** menu; if you have Workbench 1.3, click on the close gadget for the window and then re-open it by double-clicking on the **Programs** disk icon. The set of icons for the package are now displayed.



6 Running the *Flexer* software is now simplicity itself – just double-click on the **Flexer** icon and off you go. Above we've shown a screen shot of one of the example databases that comes supplied with *Flexer.*

To get at the other software on the disk – apart from the **Debug_Utilities** – you just follow these same six simple steps.

Protext 6 - *A Winning Performance*



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WorkBench New Look

- New WB menus, requesters, gadgets
- Screen requester to select mode ***NEW***
- ARexx interface ***NEW***

Some highlights of Protext 6

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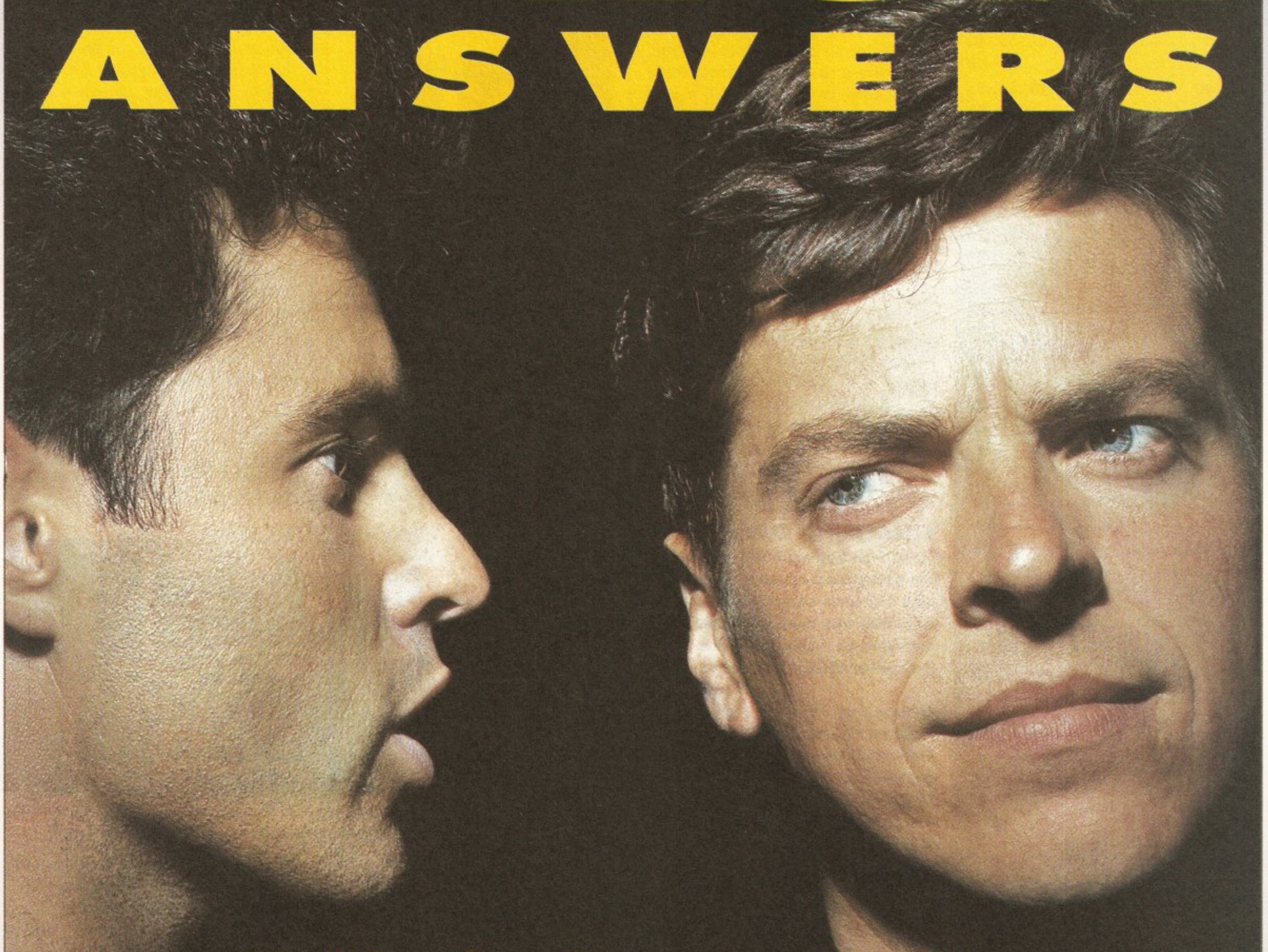
The list price of Protext 6 is £152.75 but you can order direct today for just **£99** inclusive. For any Amiga with 1Mb memory and WB 2.0 or later. Phone us today and we will send you a usable demo version and a full specification, absolutely free. Upgrade offers available - please call us for the current price.

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AMIGA ANSWERS



Inside the Answers Special

BEGINNERS

Beginners

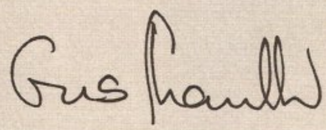
CONTENTS AT-A-GLANCE

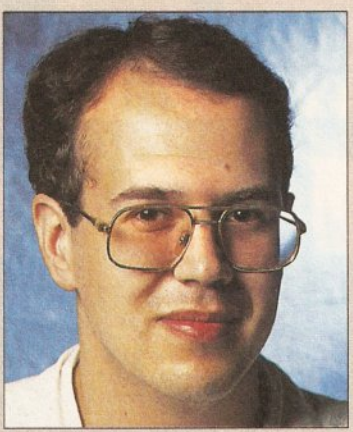
NO PROBLEM!

Welcome to our specially-expanded Amiga Answers extravaganza. For our special feature this month we've packed a mammoth 26 pages full of detailed technical advice to help you solve those problems that have kept you baffled. We receive easily more than 100 questions a week, and we've asked our experts in each area of Amiga use to deal first with the problems that crop up most frequently in our bulging post bag, and then to tackle as usual a selection of your letters, covering a very diverse range of queries and experience.

We're starting off with a four-page section targeted firmly at the needs of the Amiga novice, before we go on to deal at length with your queries on everything from accelerators to video. And in between we've included a detailed section on programming – including in-depth advice from our resident code expert Toby Simpson on how to debug problematic programs. We've had Mark Smiddy puzzling over your queries on the intricacies of AmigaDOS and struggling hard to bring to mind all the commonly-asked questions about memory. Mark has also tackled your queries about hard disks and your problems with business software. Musicians haven't been overlooked either – for this special feature we've recruited the services of Maff Evans, a talented computer musician and Reviews Editor on our really quite excellent sister magazine *Future Music*. If you've got a problem with a printer or want the low-down on how to sort out a snag with a DTP or WP package, Jeff Walker has the answers. Last but by no means least comes our section on video and graphics, carefully crafted by Gary Whiteley.

As always, if there's any specific problem we haven't yet solved for you, do take advantage of the form on page 57 and send in your query for our experts to answer in the pages of *Amiga Shopper*.





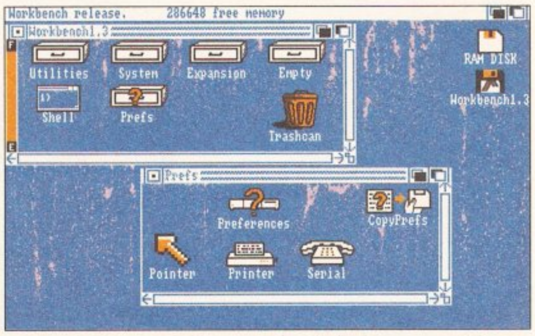
This month, Gus Chandler not only sorts the experts' answers, he tackles beginners' queries himself.

COLOURING CORNER

When I boot up my A500 I find that the background colour is a vivid blue. I've seen other people's machines with more restrained backgrounds – can you please tell me how to change this on mine?

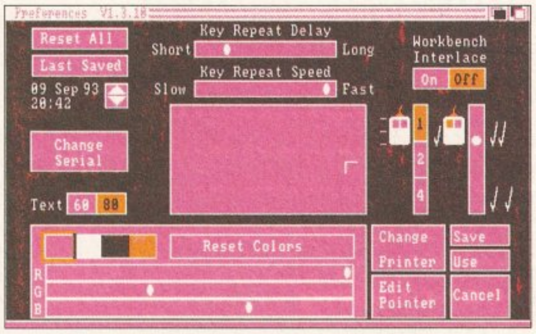
An easy one, this – open up your Workbench window (you should know that to open a window all you do is double-click with the left mouse button on the appropriate icon – in this case the one called **Workbench 1.3**) and then double-click on the **"Prefs"** drawer icon. Now select the **"Preferences"** icon and a screen will open from which you can edit the default colour settings – as well as some of the system's other defaults.

To change any of the default colours you use the three slider bars marked **R**, **G** and **B** (for red, blue and green) at the bottom of the screen. Naturally you have to select which default colour to alter – and you do that by clicking on the palette bar immediately above the slider controls. If it's the background colour that you want to change then you'll find that this is the one that is already selected – so just move one of the slider bars and you'll see the background colour of the screen change before your very eyes. To edit the colour that text is printed in, you just select the second colour box above the sliders and then mix away to your heart's content.



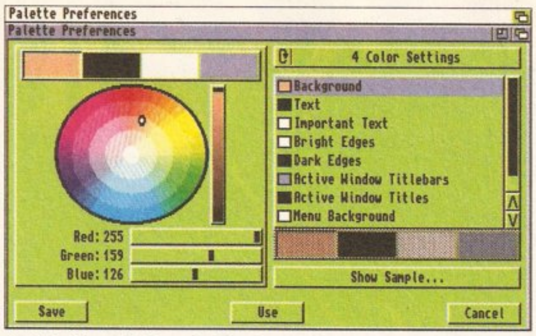
If you find that blue background is just too much in the morning, double-click on the "Preferences" icon.

If you've never selected the **"Preferences"** window before then you may want to take the opportunity to alter some of the other system defaults while you are here. For example, you can change the tracking speed of the mouse – that is, how sensitive the mouse pointer is to movement of the mouse. Most users seem to find that once they've got the hang of pointing at objects with the mouse it's most convenient to use it at its full speed. Similarly, you can also set the time for the mouse's "double-click" selection. Again many users seem to prefer this set to the fastest response. In any case the choices that you make here aren't binding – you can come back and change them when the mood takes you.



Use the R, G, B (Red, Green, Blue) colour sliders to mix up a foul-looking background of your own choice.

If your Amiga is using Workbench 2 or higher then you'll find that the colours are altered in a slightly different manner. As in the previous example you should open up the **"Prefs"** drawer from the Workbench. To alter the settings for your screen colours you should now select the palette icon, which will take you to a screen that has a "colour selector wheel" on it. Rather than having to "mix" the colour that you wish to use with the slider bars (although you can still adopt this approach if you choose), you can just drive a single control around the colour circle until



In Workbench 2 or 3 altering default colours is simple – just pick a shade from the colour selector wheel.

you stumble across the desired shade. To save your new defaults just click on the **Save** button towards the bottom left of the window.

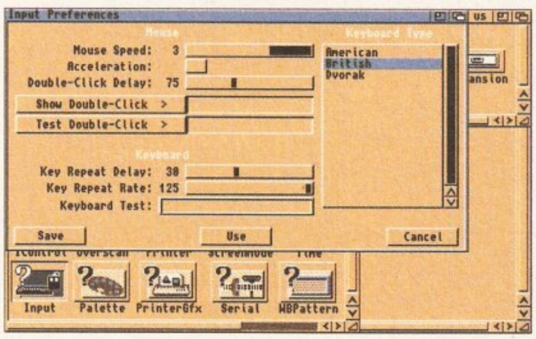
WHAT LANGUAGE DO YOU SPEAK

Some of the characters on my keyboard seem to be in the wrong place. For example, if I try to use the key that is marked as the wildcard character #, I actually get the ´ character instead. In the end I located # where the £ symbol should be. What's going on?

The problem here is that you have the wrong "keymap" selected – most likely the American variant. Once again, what you do about it depends on which Amiga or which version of the operating system you are using – and the way in which you alter the selected keymap (as with many of the other default options) is slightly different between Workbench 1.3 and Workbench versions 2 and above.

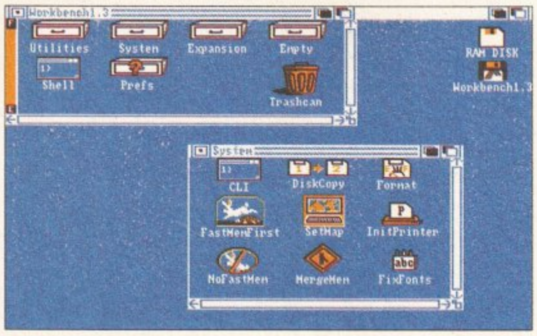
If you're working with Workbench 2 or 3 then to get the Amiga talking in the same language as your keyboard proceed as follows.

First double-click on the **Workbench** icon and then double-click on the **"Preferences"** icon that appears. The window that now opens is packed full of icons that enable you to alter many of the Amiga's default preferences. For selecting the correct keyboard the appropriate icon to double-click on is the one named **"Input"**. The **"Input Preferences"** window that now opens will be displaying a list of keyboard types down its left side. The one that you want is called **"British"**, so use the mouse to select this one. Now just click on the **"Save"** button at the bottom of the window to make your choice permanent. If you click on the **"Use"** button then the keyboard type that you've chosen will be used from then on, but as soon as you come to re-boot your system it will revert to the previous keyboard choice.



❶ *To alter keymaps in Workbench 2, select the "British" keyboard type, then click the Save button.*

Unfortunately, if you're a Workbench 1.3 user then altering the default keymap is much more of a pain. Anyway, here's how you do it:

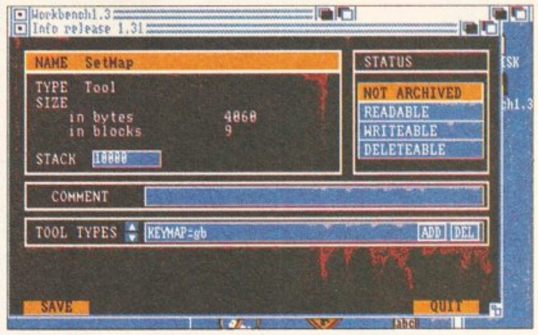


❷ *In WB 1.3, first click on the "SetMap" icon, then select the "Info" option from the "Workbench" menu.*

First double-click on your **Workbench 1.3** disk icon. Then double-click on the **System** drawer. Now click just once on the **SetMap** icon – which will select it. Now go to the top of the Workbench screen and with the right mouse button select the **"Info"** option from the **Workbench** menu. Towards the bottom of the screen that now appears you'll see a box titled **"Tool types"**. Click on the **"Add"** button at the right of this box and then click in the box to its left. Now type

```
KEYMAP=gb
```

and then press [Return]. Now click on the **"Save"** button at the bottom of the window – which after a moment will then vanish.



❸ *Once you've typed in "KEYMAP=gb" remember to press [Return] before clicking on the Save button.*

Sorry, but we're nowhere near finished yet. The next step is to double-click on the **SetMap** icon and wait while the Amiga loads the new keyboard map that you've selected. If you now care to open a Shell window and press some of the keys like **#**, you'll find that all the symbols are now where your keyboard tells you that they should be.

Unfortunately, that's not the end either – if you don't want to have to go through all this each time you boot up your Amiga, you also have to add a line to the startup-sequence to tell it to load the correct keymap each time. To do this, type:

```
ed s:startup-sequence
```

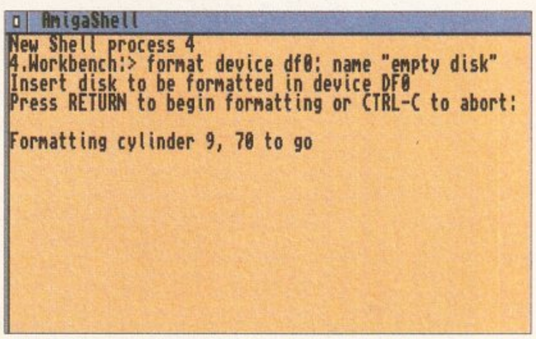
and then when the file appears add the following line immediately before the **loadWB** line:

```
setmap gb
```

Now exit the editor by pressing **[Esc]-x** and then pressing [Return]. Wait for the Workbench disk to whirr a bit as the file is updated and you have a GB-configured keyboard at your fingertips.

WHAT'S IN THE SHELL?

I've been using my Amiga from the Workbench quite happily for some time. However, when it comes to shuffling lots of files about the place I've been told that I could save myself a lot of time by using Shell commands. The trouble is I don't know how to do this. I've opened a Shell window from the Workbench but am unsure what I need to do. I can't even manage to get the Shell window to go away – it hasn't got a close gadget to click on.



Formatting a floppy disk from the Shell is a simple procedure that takes one straighforward command.

Before we leap into a detailed explanation of the Shell and all the wonders it contains, let's just deal with the last point about making the Shell

JARGON BUSTING

AmigaDOS – The most basic part of the Amiga's operating system – the collection of programs that take care of the general running of the machine. AmigaDOS concerns itself with device-handling: control of the keyboard, basic screen output, disk drives, printers and so on.

Directory – An organisational method of storing files on a disk in a hierarchy. A directory is a sub-section of a disk which may contain files or further directories or both. In this way, similar files can be grouped together.

Keymap – One of several files that are used by the Amiga to translate key presses to the relevant characters for a given country, since different countries have different layouts for their keyboards. The keymap for the UK keyboard layout (with a £ sign above the 3, and a few other little distinctive characteristics) is "**gb**".

Path – The group of directories that the Amiga will search through automatically when a command is typed in at the Shell. It will perform the search in order to find the command itself, which is stored on disk as a program.

Shell – A method of communicating with the Amiga's operating system via the keyboard rather than the more usual mouse and windows method of Workbench. The Shell is the interface which "surrounds" the Kernel, the central part of the operating system. The terminology comes from Unix systems.



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DEMON



AT THE CUTTING EDGE



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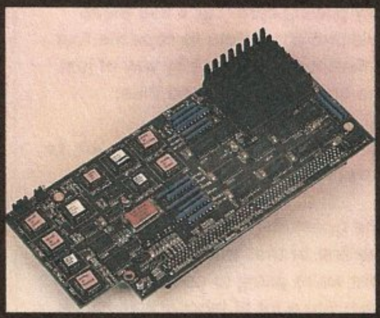
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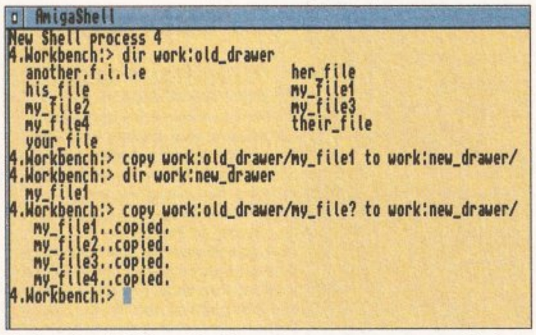
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window go away. That's because you are using version 1.3 of Workbench – Shell windows in later versions of Workbench have the familiar "close gadget" in their top left hand corners. For Workbench 1.3 users the only way to close the Shell window is to type the following command at the prompt:

```
endshell
```

This command also works quite happily under later versions of the Workbench. Indeed this is true of the range of Shell commands that are supported by Workbench 1.3 – they are all upwards compatible with Workbenches 2 and 3.

You may have heard people talk of the CLI of Command Line Interface – this is just the Shell called by another name. But what is the Shell there for? It's simply for issuing AmigaDOS commands, AmigaDOS being the name of the Amiga's operating system. Many of these commands can be accessed by other routes – principally from the Workbench menu bar (selected by holding down the right hand mouse button) but once you're familiar with simple AmigaDOS instructions you'll find that this is a much faster route.



Using the "wildcard" characters you can use a single copy command to move several files at once.

Let's start with the **dir** command. Type this at the prompt in the Shell window and you'll get a list of all the files held in that directory. You may think that you can achieve the same result just by opening up the window and examining the icons therein. However, not every file has an icon – and indeed these icons are themselves files.

Formatting a disk is another of those chores that can easily be performed from within the Shell. From the Workbench this is done by clicking once on the blank disk's icon to select it and then picking the appropriate menu item. For users of version 1.3 this is the **"Initialise"** option from the **Disk** menu, while users of Workbench 2.0 and above will find it as the **"Format disk"** option under the **Icons** menu. In both cases a **"Format** dialogue box" will appear in which you can enter a name for the blank disk and specify other options – such as whether a "trashcan" should be included on the disk once it's been formatted.

To carry out the same operation from the Shell requires just the one instruction (all as one line):

```
format device df0: name "empty disk"
```

You'll then be asked to confirm that the disk you want to format is actually in the **df0:** drive by pressing [Return] – remember that once you do this you'll lose any data you had on that disk.

Now let's take a look at the **copy** command. This is the way you move files around from disk to disk (or from directory to directory). Again, if you're familiar with the Workbench then you'll know that the alternative method is to drag the appropriate files from drawer to drawer. Unfortunately, as we've already observed, not all files have icons associated with them – and the **copy** command is the simplest way to proceed when you want to shift these icon-less files about.

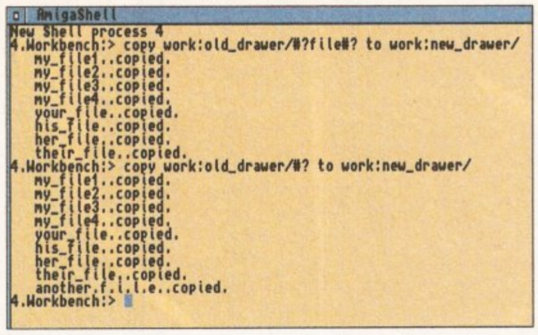
Take as an example two drawers, named for argument's sake **old_drawer** and **new_drawer.** Let's say **old_drawer** contains eight files you want to move into **new_drawer.** The first thing to do is type this one-line instruction:

```
dir work:old_drawer
```

This shows us the names of the files that are held in the **old_drawer** directory. Now we're going to use the **copy** command to make a copy of the file **"my_file1"** into the **new_drawer** directory. You do this with the following instruction (again, enter this as one continuous line):

```
copy work:old_drawer/my_file1 to work:new_drawer/
```

The text **"work:old_drawer/"** before the file name is known as the "path". AmigaDOS's directory structure has a "tree" structure and this path information is required to tell the operating system where exactly the **new_drawer** directory is situated. You'll notice that you need not specify the file name at the end of the "object" or destination path for the file. That's because it's unnecessary – the file will automatically be given the same name **"my_file1".** If you want you can specify a filename at the end of the "object" path – if you do this, then the copy of the file that is created will bear the new name.



The pair of "wildcard" characters #? enable you to copy all the files in a directory with a single command.

The **copy** command really comes into its own when you want to copy a number of files from one location to another. You do this by using what are known as "wildcard" characters to make up part (or all) of the filename. A good analogy for these "wildcards" is to think of them rather like the joker in a pack of cards – they can stand for any character, rather like the way that a joker is often used to stand for any playing card. Let's use these wildcard characters to copy the four different **my_file** files by way of just the one **copy** command thus:

```
copy work:old_drawer/my_file? to work:new_drawer/
```

The question-mark after **"my_file"** is the first of the "wildcard" characters that we're going to use. This will save you a lot of laborious re-typing. What it means is "substitute any single character at this position" and when it's combined with part of a file name as in this example it is known as a "search template". Using the **copy** command with this template will copy all the files from the directory **"old_drawer"** that start with **"my_file"** and have a further single character after the name – **my_file1, my_fileG,** whatever it may be.

You can extend your use of these wildcards to enable you to copy all the files from a directory that include the word "file". The instruction to use is:

```
copy work:old_drawer/#?file#? to work:new_drawer/
```

This second wildcard character, **#** (called a "hash", if you didn't already know), means "any number of occurrences of the following character".

From the previous example you should now be able to see that to copy all the files from one directory to another you can substitute the pair of wildcard characters **#** and **?** for the entire filename in the copy instruction thus:

```
copy work:old_drawer/#? to work:new_drawer/
```

Note that the use of wildcards is by no means restricted to the **copy** command. Indeed, they can be substituted for filenames (or parts thereof) with any appropriate AmigaDOS command.

Just one other point about **copy.** We've used the **to** parameter throughout these examples to separate the "from" and "to" paths, but this is in fact optional and can be omitted. You only need to separate the two path strings with a space, so the following is a perfectly valid command (like all these, one line):

```
copy work:old_drawer/#? work:new_drawer/
```

Another AmigaDOS command that you'll need to use from time to time to keep your disks tidy is **delete.** With **delete** you specify the name of the file that you want to dispose of, and the path to it. For example:

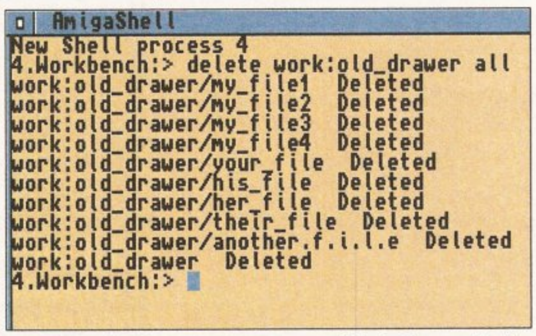
```
delete work:old_drawer/my_file1
```

This will erase **"my_file1"** from the **"old_drawer"** directory. Any files with the same name that exist in other directories will be left untouched.

You can use wildcard characters with the **delete** command – but be very wary of doing this: it's extremely easy to throw away files that you had no intention of deleting. If however you do want to delete all the files in a directory, you can do so with this command:

```
delete work:old_drawer/#?
```

If you have a sub-directory "nested" within the **old_drawer** directory then the previous command won't get rid of either it or any of the



Using the "all" parameter you can delete the contents of a directory – and the directory itself. So be careful!

files that are held within it. To do this you add the parameter **all** at the end of the command line thus:

```
delete work:old_drawer/#? all
```

Lastly, if you wanted to delete the directory **"old_drawer"** along with all its contents – including any sub-directories and the files that they contain – you'd use the following **delete** command:

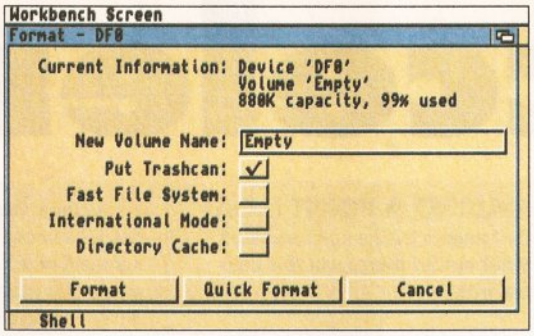
```
delete work:old_drawer all
```

Right, well, that's a few of the most basic AmigaDOS instructions. If you want a more detailed explanation of the full intricacies of the operating system then get a good book on the subject – a good start is *Mastering AmigaDOS* by Mark Smiddy, available from Bruce Smith Books (☎ 0923 894355) at £21.95.

PULLING A FAST ONE

When I come to format a disk I get a requester window that contains a number of options like "Fast File System", "International mode" and "Directory Cache". What do these mean and when should I be using them?

Let's deal with the various options in the order in which they appear in the requester window. The first option is to give the disk a name. A default name of **"Empty"** appears in the box, but it's good practice to give your different disks their own unique names. Otherwise you're almost sure to run in to the problem at a later stage of being asked to "Insert volume Empty in any drive" and not having a clue as to which disk the system is after.



Remember to give each disk you format a different name – otherwise it can all get a bit confusing.

All of the other options are "switches" – they have just two possible values, on or off. If the option is enabled then you'll see a tick in the check box. This is the default setting for the first of these options, **"Put trashcan"**. If you leave this selected then once you format the disk you'll find that it isn't quite blank – a trashcan icon will have been included. The point of the trashcan is that it makes deleting files on that disk simple – you just have to drag their icons into the trashcan.

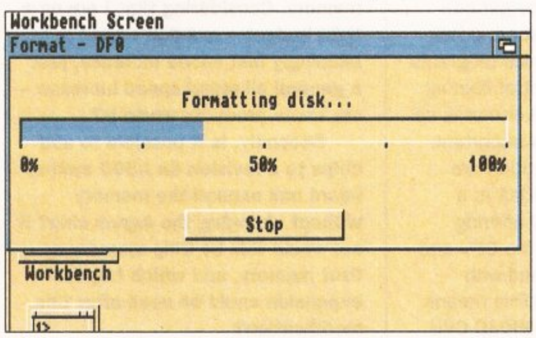
The next of the options is whether you want the disk formatted using the Fast File System (FFS). In brief, Commodore were much criticised about how slowly their original system (known as the Old File System) worked, so they introduced the FFS. FFS is no quicker when it comes to writing information to a disk, but since it writes data in contiguous blocks (one after another) wherever possible, it can be significantly faster than the OFS when it comes to reading the data back in. The only drawback with the FFS is that floppy disks formatted under this system aren't compatible with Workbench 1.3, so if you exchange disks with users of WB 1.3 machines then don't format them under FFS.

International mode exists to correct a bug that existed with the formatting system under WB 1.3. The bug concerned the way that characters from the international character set were represented. Commodore's advice is to keep this option set – although this isn't its default position. However, if you don't it's highly unlikely that you'll ever encounter any problems – and you'll also be producing disks that are readable by Workbench 1.3 based machines.

The **Directory Cache** option is a further extension of the format procedure that is available to WB 3 users. If you have this switch enabled while formatting a disk then you'll find that when you come to open up icons such as drawers their contents pop on to the screen a tad more speedily than you will have been used to. If you're only going to use your disks on WB 3 machines then select **Directory Cache** – but remember it's not backwards compatible with earlier Workbenches.

Now to the three buttons at the bottom of the requester window. These are **"Format"**, **"Quick Format"** and **"Cancel"**. **Cancel** will simply abort the process – no changes will have been made to the disk. Clicking on **"Format"** brings up another requester asking you to confirm that the disk in the drive is actually the one that you want to format (nothing like being certain and all that). Click on the **"Format"** box in this requester and away you go. Then there's the **"Quick Format"** option. Use this if you already have an Amiga-formatted disk that you wish to re-initialise – it's much quicker than the standard format option.

Finally, the formatting process can be aborted mid-way if you're so inclined – just click on the **"Stop"** button. But be warned, if you're doing this because you've realised you're formatting a disk which you still had information on – tough. You'll almost certainly have already lost the data. And even if it hasn't been physically removed, you'll need a set of disk "tools" even to be able to attempt to recover it.



You can abort the format procedure midway if you like – but your data will have been trashed by then anyway.

A STEP BACK

When I've seen other people using the Shell, they seem to be able to get back the previous line that they entered by using one of the arrow keys. What's going on?

A useful little feature of AmigaDOS, this one. It's called the "command line history". What happens is that each time you enter a line at the Shell prompt and press [Return], the line is stored as part of the command line history. Using the up and down arrow keys you can page through all the lines that you have entered since that Shell window was opened. If you have more than one Shell open at a time you'll find that each has its own separate command line history.

To display the previous line that was entered, use the up arrow key. Repeatedly pressing up arrow will take you back through a list of all the previously-entered command lines. Down arrow will scroll you forwards through the file – but since you are already at the front of the history listing you'll find that this is only valid if you've used the up arrow to take you backwards in the file.

You'll find that being able to recall – and edit – the previous line can came in very handy, particularly if you've just made a typing mistajke in a long command. If you're entering a series of similar commands it's also a boon – just call the last line back and edit a few characters of it. ***GC***

JARGON BUSTING

Bootblock – The first two sectors of an AmigaDOS disk located at track 1, side 0. The bootblock is used to describe the filing system in use and can contain a special program to "boot" certain disks (that is, load and execute from a reset). This is how most simple viruses get into the system.

Contiguous – All together in one lump. Reading data that has been stored contiguously should be faster than reading "fragmented" data, but the Amiga loads programs anywhere into its available memory. If it begins with 1Mb and loads in a short program, this may well end up somewhere in the middle of memory, meaning that the available contiguous memory has suddenly been halved, whereas the overall available memory has been only slightly reduced.

FFS – Fast Filing System. A new filing system driver that was introduced with Workbench 1.3. Disk blocks are arranged so large amounts of data can be read quickly. Reads and writes are sped up by up to seven times. Directory searching is around ten times faster and the hard disk partition limit is raised to two Gigabytes. Some older hard disk systems cannot boot with FFS. Also, it is not available with floppy disks under AmigaDOS 1.3, which is a bit of a pain.

OFS – The old filing system dating back to the days of the very first Amigas. It works, but is hardly suitable for the greatly improved speeds and storage capacities available with hard disks. If you use floppy disks with Workbench 1.3, though, this is what you're stuck with. Don't worry – it's not *that* slow. Really.

Startup-sequence – A program which is executed every time the Amiga is switched on and after every reset. It sets up the system so that it is usable from Workbench, and may be customised by those who have unusual hardware or software requirements.

HARDWARE

Accelerators

COMMON QUERIES

MANAGING MEMORY

What does MMU mean, and am I likely to need one?

MMU stands for Memory Management Unit, and probably not! An MMU is a specialised piece of hardware which is responsible for taking the load of complex memory management away from the Amiga's CPU. With an MMU, and suitable software, it is possible to implement "virtual memory" systems, whereby an area of your hard disk can pretend to be real RAM. It is also possible to make areas of memory protected to prevent other programs accessing them.

In Amiga terms, however, very few programs actually use the MMU. Currently, they are most useful to programmers as a development tool. Some advanced expansion software, such as the *Emplant* Apple emulator, most Unix emulators and the *GigaMem* virtual memory system do require an MMU. ***TS***

MAKING A POINT FLOAT

Do I need a maths co-processor? What sort of things will this help me with?

A maths co-processor or "Floating Point Unit" (FPU) is a special chip which is designed to do floating point maths (calculations involving fractions with varying numbers of decimal places) very quickly indeed. Many programs, such as raytracing, *Vista-Pro* and other graphics-based applications will speed up considerably with the addition of an FPU. For the average user, who does some word-processing and a bit of Comms perhaps and plays games, the addition of an FPU is unlikely to make much difference. The more seriously you use your Amiga (DTP, for instance) the more likely you'll notice having one. ***TS***

MIP OVER HERE

What does MIPS mean, and what relation is it to MHz?

MIPS stands for "Millions of Instructions Per Second". It describes how many machine code instructions any given processor can execute in one second. An A600 Amiga manages just under 1 MIP. An unexpanded A1200 manages about 2 to 3 MIPS, or with the addition of some Fast RAM about 5 MIPS. An A4000/040 will just about reach 18 MIPS, which makes it the equivalent of about 20 A600s. If you had a Dec Alpha CPU (not available in Amigas, unfortunately) you could do about 150 MIPS. This is the power of 12 Amiga A4000/040s – only in a much smaller box! MHz, on the other hand, is the speed at which the CPU is clocked. This dictates its speed in MIPS. Different processors have a different ratio of MHz to MIPS. The 68000 in the A600, for example, at 7.14MHz does not manage even 1 MIP. If you were to clock it at 14MHz it would just about manage it. On the other hand, a 68020 chip (like the one in the A1200) clocked at 14MHz manages nearly 5 MIPS. A 25MHz 68040 (18 MIPS) is much faster than a 25MHz 68030 (10 MIPS). Incidentally, the MIPS equivalent for FPU chips is "MFLOPS", Millions of Floating Point Operations Per Second. ***TS***

THE SECRET OF SPEED

Why is Fast RAM fast? And what is 32-bit RAM?

Fast RAM is faster than Chip RAM on the Amiga because the processor chip does not have to share it with the custom hardware. On an Amiga with only Chip RAM, such as an unexpanded A1200, the custom chips have to access the Chip RAM to fetch display data, sound data, and other things in order to keep your Amiga running. Unfortunately, this clashes with the processor, which has to slow down and wait until it can have access. Fast RAM is not shared, so the CPU can access it at full speed. 32-bit RAM can come with 68020s and above, and allows the processor to deal with four bytes of information at a time – twice as much as a 16-bit system, such as the A600. ***TS***

READERS' QUESTIONS

ACCELERATING AN A1200

I am looking for an accelerator card for my A1200 with extra memory to run *VistaPro* 3.0 in AGA modes. Should I buy the GVP 1230 with 4Mb and a maths co-processor, or the M1230XA 40MHz with 8Mb of RAM, or the M1230XA 50MHz MMU with 4Mb of memory? I have a budget of £500–£600. I intend to do animations with *VistaPro* and will be getting a hard drive after my accelerator card. Should I get an 80Mb, 120Mb or 170Mb drive?
John Reif
Shepshed
Loughborough

In view of the sort of things that you intend to do with your accelerator, it seems important that you get one with a maths co-processor and lots of RAM. Advanced graphics programs such as *VistaPro* do a lot of floating point maths, so the FPU or maths co-processor becomes very important. Both the boards you mention are excellent, but the M1230XA is a better-expandable board offering easy expansion of both the CPU and the FPU independently and with different clock speeds. (This means you can have a 25MHz 68030 CPU and a 50MHz 68882 co-processor for example).

In view of the fact that you also intend to buy a hard drive soon – and I think you'll find that you need it sooner than you expect if you want to experiment with animations and *VistaPro* 3.0 – it's probably going to be wisest to get the cheapest accelerator solution possible. I suggest the GVP A1230 with 40MHz 68030 and 68882 FPU. ***TS***

EASY OPTIONS?

I am thinking of buying one of the cheaper accelerators for my A500 Plus, in particular the AdSpeed or the Turbo 68000 (both 16MHz 68000s). Is there any difference between these products and are they any good? My computer is just an unexpanded A500 Plus which is used for games, word processing, DTP, Art/CAD and so on. I am also thinking of adding an extra 1Mb memory. Considering that I am on a tight budget – and don't need a blindingly fast speed increase, just a general all-round speed increase – are these products worth it?

Secondly, is it possible to add chips to a revision 6a A500 mother board and expand the memory without changing the Agnus chip? If so, would this be Chip memory or Fast memory, and which trapdoor expansion could be used after this modification?

Is the Commodore A590 a good hard drive to buy if you cannot afford anything more expensive?
Steven Hales
Mansfield

My own personal opinion of the 68000-based accelerators is that they do not offer blindingly good value for money. You are not getting an improved 68000 series chip, and there is little possibility of adding a maths co-processor at a later point. In view of the fact that you are thinking about getting a cheap hard drive and some additional memory too, I wouldn't look at the A590 but instead some of the GVP products, particularly the A530. This comes with an extra 1Mb of very fast 32-bit RAM, a 40MHz 68030 chip, and the possibility to add a floating point co-processor (which will help your DTP, art and CAD) at a later point. As well as all this, it comes with a hard drive. There are similar products by other manufacturers, but the GVP one fits nicely into an A500 system. Contact Silica ☎ 081 309 1111.

It's not recommended to add chips to the A500, it's best to get the upgrade done by an authorised dealer. Newer A500s will take an extra 512K of Chip RAM on the mother board, but this is likely to affect the trap-door expansions. ***TS***

JARGON BUSTING

CPU – Central Processing Unit. This is the heart of your computer, the actual computer chip itself. In the case of the Amiga this is from the 68000 series of chips by Motorola. They range from the original 68000 chip to the advanced 68060 chip, due out later this year, which is at least 70 times faster than the 68000 chip in the A600.

RAM – Random Access Memory. Think of this as "read/write memory". You can read information from it, and you can write information to it. It is not permanent, and when the power to the RAM chips stop their contents are lost (unless they are battery-backed). ROM is "Read Only Memory", and it is "non-volatile" – meaning its contents remain even when there is no power to the chips. Your Amiga contains a ROM chip which has the KickStart on it – the software which makes your Amiga work. Without this ROM chip, your Amiga is simply a useless box full of electronics.

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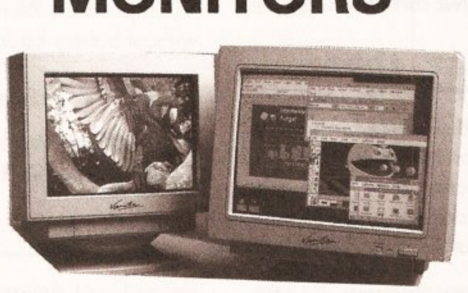
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Commodore 1960	14"	.31	MED	NO	MULTI	POA
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Commodore 1942	14"	.28	MED	YES	DUAL	POA
Microvitec Cubscan	14"	.31	MED	NO	MULTI	POA
New Horizon Vanilla	15"	.28	HIGH	NO	MULTI	POA
New Horizon Vanilla	17"	.31	HIGH	NO	MULTI	POA

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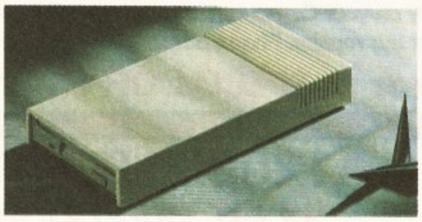
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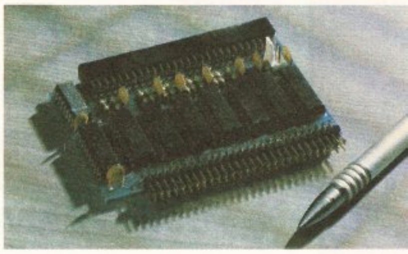
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CODING

Programming

COMMON QUERIES

SPEAKING IN TONGUES

I'm thinking of learning programming. What should I learn?

There's really no answer to this. It really depends on what sort of programming you are thinking of doing. If you're thinking of writing serious programs on your Amiga, then it might be best to consider C. If you're considering writing high-speed games, Assembly language might be the choice. If, on the other hand, you're just interested in having a play around, then consider some of the versions of BASIC that are available for the Amiga. C is definitely the preferred choice on the Amiga for serious work – Kickstart 2 and above are written in C.

REGISTERED ENQUIRY

Where can I get the AGA chipset register information? There does not seem to be an updated hardware reference manual.

I'm afraid you will not be able to obtain this information. Commodore have decided not to release it and to encourage people to use the operating system instead, because this will ensure future compatibility of products. Contact Commodore and ask for information on the version 3.0 Native Developer's Upgrade Kit if you wish to learn about the AGA chipset a little more.

ART OF TRANSLATION

What is the difference between a compiler and an interpreter?

Both are methods of translating programs written in one language to machine code, the language used by your Amiga's central processor.

An interpreter translates each line of your program in turn, as it is being executed. Every time the program is run, this translation occurs, resulting in a relatively slow program. Also, if your program contains a loop, the body of this loop will need to be translated for every iteration.

A compiler translates a program wholesale, so that the result can be executed as many times as you wish without need for further translation. Compiled programs run faster than their interpreted counterparts, but are more difficult to develop, because a more complex translation process needs to be carried out before any errors in your code come to light.

WHICH C FOR ME?

I want to learn C programming. Which package should I get?

The package of choice is SAS C, sold in this country by HiSoft (☎ 0525 718181) for £329.

This is a lot of money, and you may want to try a shareware package such as DICE ($50 to register) before committing yourself.

READERS' QUESTIONS

A RANDOM QUESTION

I am trying to generate random numbers in C. How do I do the following?
1. Seed the call with a value read from the horizontal beam control register.
2. Generate a random number between 0 and 1 which I can use to generate any series of numbers that I like.
3. Make sure that the series of numbers is always different. It is often the case that I get the same series of numbers when I start the program.
Niall Davis
Karlsdorf
Germany

1. It is best not to seed the random number generator with values from hardware registers, because this may not necessarily remain compatible in the future. It's much easier to seed it from the system time counter, which is guaranteed to be different. The C function to seed the random number generator is **srand(x)** where **x** is the seed. This will work just fine:

```
int seed_value;

seed_value = time(NULL);
srand(seed_value);

printf("Here is a random ▼☛
number: %ld\n", rand());
```

2. Using the modulus function you can generate pretty much any sequence you require anyway from the **rand** function, which returns an integer. If you want numbers between 0 and 1 you will need to use **drand.** The function **drand48** returns a double-precision floating point number from 0.00 up to, but not including, 1.0. For example:

```
#include <math.h>

double random_number;

random_number = drand48();
```

3. The series of numbers will always be different if you seed the random number generator correctly using **srand.** See the first answer. ***TS***

DEVIL OF A PROBLEM

Having sold my aging A500, scrounged every bit of money that I could and promising to sell my soul to the devil, I finally got enough money together for a new A1200, an extra 2Mb of RAM, an 81Mb hard drive and SAS C 6.2. I got myself a copy of the *Amiga ROM Kernel Reference Manual – Libraries*, 3rd edition, and tried to go through some of the examples. But I keep getting software failure 8000000b. Every Intuition function I call seems to have the same effect.

What is going on? I must be doing something fundamentally wrong, but I can't see what it is. Please help.
Mike Carlin
Bristol

Well, I looked at your listing and found a couple of things that were wrong. One of the first things I did was to identify your Guru message. It means "F line emulation error". This tends to mean your program is very very ill indeed. From your description of what is happening, I suspected something was wrong with your opening of the **intuition.library,** and that was where the mistake was. You had done this:

```
if (IntuitionBase = NULL)
  CleanExit(RETURN_WARN);
```

You should have had a double equals sign – == – instead of just one. What you were doing is setting **IntuitionBase** to **NULL**, and then, as this evaluates to false, the program did not exit, but plummeted on with **IntuitionBase** equal to zero. Hence the **OpenWindowTagList** failing. Change the **if** statement to look like this:

```
if (IntuitionBase == NULL)
  CleanExit(RETURN_WARN);
```

And all will be well again! ***TS***

STEPPING UP

I have started programming using the DevPac assembler, and I'm upgrading to the A1200. I would like your advice on the following:
1. Is there a trade in/upgrade offer for my ROM Kernel books? I cannot afford £30 a time for the AGA updated versions.
2. Is it worth upgrading to DevPac 3, or is there a new version coming along for the new machines?
3. Which routines would I need to learn in order to program boot-blocks?
Anthony Taylor
Selby
North Yorkshire

1. There aren't any AGA updated versions of the ROM Kernel Manuals currently, but expect them later. There is no trade-in deal. If you buy 3rd edition manuals (For workbench 2) these are the most up-to-date currently in existence.
2. Yes, it is worth upgrading. DevPac 3 is written to take advantage of the new system software and is an excellent assembler – it comes with an advanced editor, a fine debugger and good documentation.
3. You should not ever need to program boot-blocks. There are some dubious books around that will tell you how to do this, but it is not within Commodore's programming guidelines, and is certainly not recommended (especially for beginners). ***TS***

JARGON BUSTING

AGA – Advanced Graphics Architecture, the new graphics chips that are at the heart of the A4000 and A1200 computers, previously known as the AA chipset.

Rom Kernel Manuals – These, also known as the RKMs, are the official books published by Addision Wesley for Commodore. They explain how to use the Amiga operating system in detail. They are the bibles for anyone thinking of learning to program the Amiga.

They don't teach you how to program, but they will show you how to use your programming skills properly on the Amiga. They contain lots of advice for programmers.

CODING

Debugging

Will programming turn you into Sherlock Holmes? Not quite, but Toby Simpson explains how it helps your programming if you are a budding detective...

Have you ever fancied yourself as a detective, sifting through the clues in that attempt to nail the villain? If so, perhaps you can find a happy life in the programming industry. Quite a sizable percentage of programming time, on large and small projects alike, is spent trying to track down the problems, the things that aren't quite working as they should do – the bugs. They take many forms. The huge, blindingly-obvious programming flaws which spring out and shout "Hey! I'm a serious bug!" are usually pretty easy to find. Then there are the subtle ones, the ones that never happen in the same place twice, those that are hard to reproduce, and when they do happen have different results. This is where debugging becomes a skill. As Sherlock Holmes himself once said: "Once you have eliminated the impossible, whatever is left, however improbable, must be the answer." Debugging is simply an exercise in logical deduction.

Bug-hunting can easily be the most stressful part of any project development, both for home programs and professional ones. It can take hours, days or even weeks to find bugs, and the more upset and stressed you get about it, the less likely you are to find them.

However, by far the majority of bugs are easy to find and fix, so we won't be dealing with these other than a brief mention in the "common problems" section. What I'll attempt to do here is help you find the bugs in your program that are not so easy to find, with some common debugging techniques and a number of handy utilities. This is by no means an exhaustive guide to bug-hunting, and could never be. It's the general techniques that are important, and they should apply to all kinds of faults. So, what kinds of bugs are there?

• Syntax faults

This is where you have simply made an error in the usage of the programming language. This could be simple, such as missing a comma or a semi-colon out, or more complex, where you might have used the wrong format of a command. In the case of most syntax faults, the compiler or assembler will pick these out for you and won't allow you to run the program until you have fixed them. In the case of most syntax faults, it's simply a case of looking calmly and sensibly at the program code in question to find your error.

One thing to check carefully is any use of brackets – it's easy to include more open brackets than close brackets or vice versa. Errors generated this way will often not be detected until several lines after they occur, so always look back at the lines preceeding where an error was noticed.

• Program faults

These are problems in your programming itself. The compiler or assembler won't pick these up, because the program that you have written is syntactically correct. These are tougher to find. There are simple ones, where you know immediately what the problem might be – for example, when your window opens on the screen with a corrupted window title. This sort of bug can usually be only a couple of things, so it is easy to find. Or is it? This is where the fun can start.

TRACKING DOWN PROGRAM FAULTS

So, you've got a fault. Your program is not behaving as it should, and you have checked the obvious things and it isn't them. You're stuck. First things first: get some paper and a pen, this is where your detective work begins. You are after evidence and clues, no matter how insignificant they might be. If you have a large program it can seem like a nightmare about to begin: "I have 30,000 lines of code here, and a bug. I have no idea where this bug is, and I don't know where to start."

Don't panic. You don't really have 30,000 lines of code at all. The bug can't be in *all* of your lines, it can only be in a few. Eliminate where it can't be, and whatever is left is where the bug *must* be. This is where your evidence comes in handy. If the program crashed with a guru number, for example, note the numbers. If it was, for the sake of example, "Divide by Zero error", then search your program for all usages of divide. If this does not reveal the fault, then you must be calling something which does a divide by zero. What could this be? Well, if it isn't *your* program that is failing, it's the operating system. So you can discard every part of your program that does not call the operating system. And so on, and over time the amount of code that you have left to search through for the bug gradually becomes smaller and smaller until whatever you are left with, however unlikely it might seem, is where the bug is.

This general technique is your biggest weapon in the war against program faults. If you don't know where the bug is, *don't look for it.* This applies in all cases: spend your time writing down all your evidence and reducing the amount of code you have to look through to find it. Spending hours and hours looking blankly at screens of source code expecting the bug to spring out and say "Here I am!" is short-sighted and is unlikely to reveal anything – although, very rarely, through luck

---

BEGINNERS START HERE

What is a program?

Nothing like starting right at the beginning! A program is just a sequence of instructions, which are followed one by one. As a human being you might "run" this sort of program when you cook your meal:

1. Turn oven on.
2. Is oven hot enough? If not, go back to step 2.
3. Put food in.
4. Is food cooked? If not, go back to step 4.
5. Take food out.
6. Turn oven off.
7. Eat food.
8. Wash up.

Okay, maybe the last line in the program is a little over the top! But this is a program. It contains a sequence of instructions, and a number of loops. The first loop is at step 2, where we loop around in circles until the oven is hot enough to proceed to the next step in the sequence.

The meal-cooking example above is made up of quite complex instructions. Each of the single steps can actually be broken down into many smaller steps. For example, take step 5:

5. a. Open oven door.
b. Take food out.
c. Put food down.
d. Close oven door.

Our first example is a "high-level program", in that each instruction can be broken down into many smaller ones. In our second one, we have a much lower level program, in that it becomes harder and harder to break down our sequence into simpler steps. As you can see, for a lower level program we have much more control over the individual details, but the program is longer.

The same thing applies in computer programs. You have high-level computer languages, such as C, and low-level ones, such as assembly language. The higher-level languages are easier to write, and the programs tend to be smaller, whereas low-level languages are more detailed but you have much more control over what is happening. Low-level languages are harder to learn and program, and harder to find faults in when then go wrong.

ON THE COVER DISK

On this issue's cover disk you'll find several handy utilities to help with your debugging, including:

Alert – Tells you what a Guru number actually means.

Monitor – A machine code monitor that enables you to view memory and machine code. Complete with documentation.

rather than judgement, you *can* strike lucky. Make your life as easy as possible. When you have collected all the information that you can, your job should no longer look so hard. In our above example, we might narrow it down to about 500 lines of code scattered around our program. It might now take only a couple of hours, maximum, to find the fault, even though we don't know exactly what it is; we now have enough information to recognise it, and we have reduced the code we have to search through from 30,000 lines to only 500. A much more realistic use of time.

So the best course of action for finding a bug we know little about is not to look for it, initially, but to gather some evidence to make looking for it a little easier.

GATHERING EVIDENCE

It's amazing how many programmers will quite happily spend hours, days – maybe longer – just looking at programs. But you're now a member of the smart party. Let's see how the way your program misbehaves can be a hive of useful clues.

• The Guru message

One of the most common ways in which a bug appears is in the form of a *software failure*, or Guru message. This message is vital. As soon as you see it, write it down in its entirety. It's the best clue you can hope to have.

So, what does a Guru message tell you? A Guru number is made up of two parts – two eight-digit hexadecimal numbers, separated with a dot. The first shows the error type – this might be, for example, "Divide by Zero", or "Memory Freed twice". The second part shows the memory address at which the fault happened. The first thing to do is to identify the error type.

This month's cover disk comes complete with a number of programs to help you, and one of these is called *Alert*. If you type **"Alert xxxxxxxx"** where the eight **x**s are the error type, *Alert* will tell you what this means. Some of the common ones you'll get are "Memory Freed Twice", "Divide by Zero" and "Odd Address". Just how ill your program is will dictate how sensible the answer you get from *Alert* is, but this should at least provide you with a suitable clue as to what is going on. After a reset, there is a slim chance that the program that crashed is still in memory. This is where you can use a monitor program to find out where the problem happened. (See the example program – before and after – on page 29.)

• The frozen screen

Very nasty. No message, no warning, just a frozen screen and mouse-pointer. How do you solve something like this? For this sort of bug to occur, something very serious must be wrong. Try putting delays and test points throughout your program – little calls which print strings out saying, for example, "I got to the screen opening bit". This way, when the program hangs, you look at the last known message, and that should indicate where the program was when it crashed. This general technique, of putting debug strings

COMMON BUGS

The common bugs you might encounter depend very much on the language you are using. Although the general bug-hunting techniques apply to almost all languages, there are certain things which you are particularly going to be prone to in certain languages. Most really painful bugs happen in machine code programs, those that have been assembled or compiled. Interpreted languages tend to crash a lot less badly, and normally end with a nice meaningful error message like "Out of Memory at ...".

COMMON FAULTS IN C

Quite a large proportion of bugs in C are usually to do with a misunderstanding of what the compiler does. A lot of this is related to pointers, which are very easy to misuse. Modern compilers are getting quite good at spotting potential pointer-related problems at compilation and warning you of them.

Most pointer problems are due to un-initialised pointers – those that point to 0. Another common fault is forgetting that variables declared inside functions are, more often than not, present on the stack. When you leave that function, whatever was on the stack is no more. This gives rise to two common problems:

❶ Using a variable that is defined on the stack, even after you leave the routine. For example, you might have a function called "**Open_My_Window**". This function might look a bit like this:

```
void Open_My_Window()
{
char window_title[128] = "My Title";

my_window = OpenWindowTags(NULL,
  WA_Title, window_title,
  WA_Left, 0,
  WA_Top, 0,
  WA_Width, 100,
  WA_Height, 100, TAG_DONE);

return;
}
```

Then you would use this window. The catch is that as soon as you return from the function, the place which the window title is stored is no longer valid. As soon as the operating system refreshes the window title – because, say, you deselected the window and then reselected it – it will try and get the title from where it *was:* on the stack. Only the stack contains something different now, and you get a corrupted window title.

❷ Forgetting to initialise variables. If you define local variables, set them up. *Do not* assume that they will contain zero. The compiler simply allocates a chunk of space on the stack for all your local variables. Whatever was there, will become your variable. If you need something to be zero, *set* it to zero. For example:

```
void My_Function()
{
  long loop = 0;

  while (loop++ <100)
    printf("Hello ");
}
```

The most common problem with beginners learning C has got to be confusing "==" with "=", and even experienced programmers can be baffled with strange bugs when they accidentally mistake the two. Here's an example of a faulty program section:

```
  IntuitionBase =
OpenLibrary("intuition.library",
INTUITION_REV);
  if (IntuitionBase = NULL)
    CleanExit(RETURN_WARN);
```

The above example will actually *set* **IntuitionBase** to NULL.

COMMON FAULTS IN ASSEMBLY LANGUAGE

Good documentation will prevent most of these. But there are still a number of common pitfalls that you can avoid, and perhaps you might make your first port of call if something goes wrong:

❶ Using the incorrect registers for a function call. Remember that different operating system functions use different register conventions. Make sure you're using the right ones, or all sorts of unpredictable results will happen.

❷ Forgetting that a function call will corrupt certain registers, and then using them afterwards expecting them to contain a certain value, which they will not.

❸ Using a variable as a long, when you've defined it as something else. For example, you might have a variable called "**lives**" which you define as follows:

```
lives:          dc.b    0
```

And then promptly access as:

```
    sub.w       #$01,lives
```

❹ Using a register as an offset with the wrong sizes. For example, you might want to use indirect indexed to refer to something like this:

```
    leat        able_of_offsets(pc),a0
    move.w      #$100,d0
    move.w      0(a0,d0.l),d1
```

This would in theory read the word from **table_of_offsets+$100** into **d1**. Think about what might happen if **d0** contained the hex value **"$ffffffff"** before the **move.w**. Since we refer to it as **d0.l** in our indexed instruction, the value we will actually read won't be from **table_of_offsets+$100** at all, it will be from **table_of_offsets + $ffff0100**, which is about 4 billion bytes away from where you want to be.

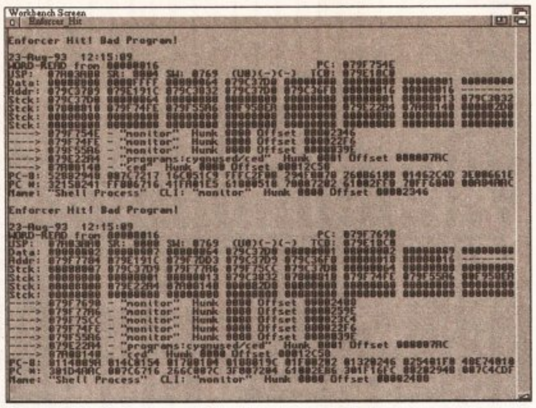
❺ Sometimes a program works fine on a 68020 chip and above, but crashes on a 68000. More often than not, this will be an odd address boundary fault. In these cases, you are probably accessing a data item incorrectly. For example:

```
    even
    dc.b        0
Odd_Variable:dc.b       0
```

The variable "**odd_variable**" is on an odd boundary. Executing "**move.l Odd_Variable,d0**" will fail on a 68000. On the 68020 and above, the CPU can fetch data from odd memory addresses.

in, is very useful for finding problems. So long as your program is well structured, you can start by putting a single message at the start of every major function saying "Entered xxxxxx" and one at the end saying "Exited xxxxx". This way, when something goes wrong, you look at the message and you should know which routine you were in when it went wrong. You can then sub-divide that one down further to try and find which part of that routine failed.

• The random crash, corrupted screen or general spookiness
This is the worst. You can't reproduce it regularly, it happens at random times, and never happens in the same routine twice. Assuming you've tried the methods above to prove it happens in different routines every time, it's safe to assume that something is happening which "affects" the program in a serious way. For example, you might be writing to illegal memory areas somewhere in your program. This memory might belong to the operating system, the screen, or just about anything. Your program might work just fine, but leave corruption on the Workbench screen. Other times it might freeze the screen, or Guru. It might affect the operating system in small ways that might make the computer crash next time you try and open a window, for example.



Enforcer – a valuable debugging tool, but only Amigas with an MMU (Memory Management Unit) can run it.

This sort of bug is a pain to find. There are a number of ways to tackle it. First, if you have an MMU, you can employ several debugging tools, such as *Enforcer*, which trap illegal writes to memory and tell you what was going on. You can also use such programs as *Mungwall* which notify you if you write over memory that you don't own. This does not require an MMU and is available as part of the

continued on page 32

TAKE A RIDE IN OUR BUGGY

It's best to demonstrate some of the things discussed above in an example program. This program has a number of bugs in it, some easy to find, some not quite so easy. The example program itself is written in assembly language, because this is the hardest to debug and the easiest language for me to hide bugs in!

The commented, debugged version is shown in Listing 2. The uncommented, bugged version is shown in Listing 1. The stark changes should be obvious. Both programs are totally identical, apart from the bugs. No new instructions have been added, no new data. The fully-commented version is 67 lines in length, an exceedingly small program. A commercial application might be more than 50,000 lines. Imagine finding a bug in 50,000 lines that look a bit like listing 1.

If you think badly-written assembly language looks a mess, badly-written C is worse. And indeed, it's almost impossible to find your way around any language if your program is written without comments, meaningful label names and so forth. There are at least 20 serious bugs in this program, and if you were presented with it and told to find them, it would be quicker to re-write it than to debug it.

If you are not sure you believe me, and you know assembly language quite well, time yourself. First write a program to open a window, wait for any message on the port, close it and quit. If you're pretty good this should take you no longer than five to ten minutes. Now debug Listing 1 and get it working. This will be a nightmare. Some bugs are obvious – for one, the library name "**intuition.library**" should not have capital letters in it. Others are not – like the incorrect registers that have been used for some of the OS function calls. Also, some of the offsets to OS routines are wrong. Should have used the include files!

In short, Listing 1 is a debugger's nightmare. It's easier for me to spot the mistakes, because I put them there. But if I tried to spot them in a month's time, it would not be so easy – I would have forgotten. More often than not, if you enjoy programming and do a lot of it, you'll be working on some programs for months, maybe years. I have some that I have had in development for three years. If I had not documented everything properly, and used the includes, and used sensible label names, then it would be almost impossible to continue to maintain them.

LISTING 1 – BUGGED PROGRAM

```
; Example program for Amiga Shopper
; Article on Debugging.
; This is the un-commented version!
; Do not program this way. You'll regret it.

START:              lea     IN(pc),a0
    moveq       #$00,d0
    move.l      4,a6
    jsr-$198(a6)
    move.l      d0,IB
    beq.s       Libok
    rts
Libok:              lea     OurWin(pc),a1
    move.l      IB,a6
    jsr-$cc(a6)
    move.l      d0,WinHand
    beqNoWin
    move.l      WinHand,a0
    move.l      86(a0),a1
    move.l      $4,a6
    jsr-$180(a6)
    move.l      WinHand,a1
    move.l      $4,a6
    jsr-$4e(a6)
NoWin:              move.lIB,a0
    move.l      4,a6
    jsr-$19e
    rts
WinHand:    dc.l    0
IB: dc.l    0
IN: dc.b    "Intuition.Library",0
OurWin:             dc.w  0,0,200,100
    dc.b        0,1
    dc.l        $200,$f,0,0,0,WinNam,0,0
    dc.w        50,50,640,200,0
;
WinNam:             dc.b  "Our test window"
```

LISTING 2 – DEBUGGED PROGRAM

```
; Example program for Amiga Shopper
; Article on Debugging.
; This is the commented version!

    incdir      "include:"
    include     "exec/exec.i"
    include     "exec/funcdef.i"        ; You
                        ; might not need this.
    include     "exec/exec_lib.i"
    include     "intuition/intuition.i"
    include     "intuition/intuition_lib.i"
;
INT:  macro                             ; Macro
                    ; to access exec.library
    move.l      IntBase,a6
    jsr_LVO\1(a6)
    endm
SYS:  macro                             ; Macto
                ; to access intuition.library
    move.l      $04,a6
    jsr_LVO\1(a6)
    endm

START:              lea    IntName(pc),a1
    moveq       #$00,d0
    SYSOpenLibrary
    move.l      d0,IntBase
    bne.s       ST_Int_Ok               ; We
                        ; opened intuition OK.
    rts
;
; — Library opened, open our window ....
ST_Int_Ok:    lea     Our_Window(pc),a0
    INTOpenWindow
    move.l      d0,Window_Handle
    beqST_No_Window             ; Failed to
                                ; open window.
;
; — Wait for something to happen ....
    move.l      Window_Handle,a0
    move.l      wd_UserPort(a0),a0
    SYSWaitPort             ; Wait for user
                        ; to click closewindow
;
; — Close our window ....
    move.l      Window_Handle,a0
    INTCloseWindow
;
; — Close intuition library ....
ST_No_Window:  move.l  IntBase,a1
    SYSCloseLibrary
    rts
;
; — Variable storage ....
Window_Handle: dc.l   0
IntBase:       dc.l   0
IntName:       dc.b   "intuition.library",0
;
; — Our new window structure ....
Our_Window:    dc.w   0,0
    dc.w        200,100                 ; Window
                                    ; Dimensions
    dc.b        0,1
    dc.l        CLOSEWINDOW
    dc.l        WINDOWDRAG+WINDOWCLOSE+☛
WINDOWSIZING+WINDOWDEPTH
    dc.l        0,0
    dc.l        Window_Name
    dc.l        0,0
    dc.w        50,50
    dc.w        640,200                 ; Mini-
                        ; mum & Maximum sizes
    dc.w        WBENCHSCREEN
;
Window_Name:   dc.b   "Our test window",0
```

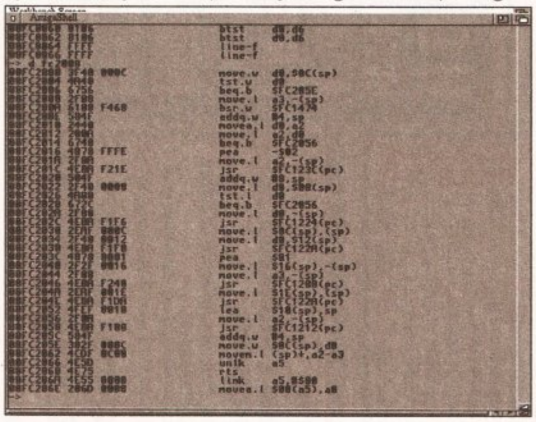
continued from page 29

Commodore Native Developer's Upgrade Kit – for details, see the box in the right-hand corner of this page.

You might also write a small debugging routine which checks all of your known data areas for anything abnormal, and call it at the start of each section and print a message if something was amiss. For example, you might get the message:

```
"entered process_objects,
object structure OK"
"exited process_objects,
object structure corrupted"
"entered show_sprites,
object structure corrupted"
```

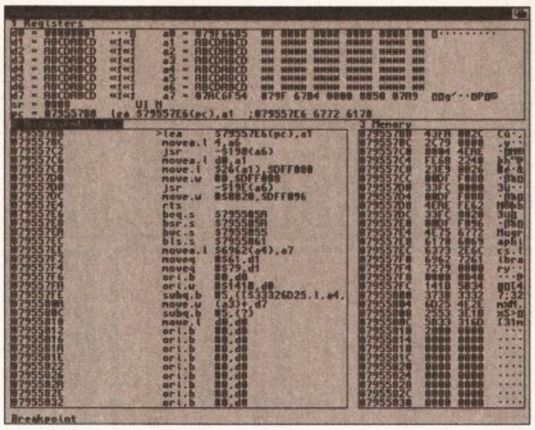
Well, you would know that it wasn't corrupted when you entered your routine "**process_objects**" – all was just fine. On exit, however, your object structure didn't check out. So you now know that "**process_objects**" is probably doing something that it ought not to do. Continuing to write small routines like this will save you a lot of time in the long term, and is far preferable to staring at a screen for ages!



The machine code version of your code "disassembled" back into assembly language so you can debug it.

THE DEBUGGER

If you've got a commercial compiler or assembler then the chances are high that you have been supplied with some debugging software. This will help you to pinpoint exactly where some faults happen. There's a limit to the sort of thing a debugger can find, but it can be a good place to start. What a debugger won't do is find your bugs for you. You still have to have a fair idea of what is going on, where the bug might be, and what it might be in order to make much use of a debugger. If you have a commercial debugger – such as *Code Probe*, which is supplied with SAS C 6.0 and above, or perhaps *MonAm3*, which comes with the DevPac assembler from HiSoft – the best thing to do is to read the manual in great detail, apply some of the above detective techniques to it and use it as a tool. You will be able to find a lot of bugs this way.



MonAm showing you your code at its most basic level – hex version on the right and mnemonic on the left.

PROGRAM DOCUMENTATION

Give yourself some help: document your code. I've seen source code to entire commercial computer games without a *single* comment in it. It does *not* take much time to put comments into your program explaining what you are doing. Document *all* of your routines – explain at the start what the routine does, what parameters it might take, and if it's in assembly language perhaps mention which registers will be corrupted with the routine. Don't be silly though. This small C example is being silly:

```
/* Show hello on the screen */
printf("Hello\n");
```

That is simply obvious. Comment what isn't obvious. Comments like "add one to loop" are a waste of time, and won't help you if you need to come back to a program after a few months and figure what is happening. Be sensible. A good comment might be "calculate percentage completed". It might apply to a few lines of code, but you know at a glance exactly what is going on. You don't need to comment every line; comment functional groups of lines. Explain to yourself what you are doing. Break things up so they look neat and tidy.

There are things you can do which help make your code self documenting. Use meaningful and sensible variable names. Reams of variables called "**a**" and "**b**" are no use to anyone – particularly yourself, if you have a bug. Name them what they are: "**screen_position_x**" is far better than "**x**", and "**lives_remaining**" is better than "**l**". And besides, if you wanted to search your program for every reference to "**lives_remaining**" it's a whole lot easier than searching for "**l**" – because then you'd pick up every single "**l**" in the program.

Structure your program neatly. Try and break your program down into functional sections that do particular things and keep them separate. To use an example of a computer game in C, the main game loop might look a little like this:

```
Setup_Game();
lives = 3;
while (lives != 0)
  {
  Play_Game();
  lives = lives - 1;
  }
Show_HighScores();
```

Not a comment in sight, and yet to anyone who understands C this should be reasonably self-documenting. We can see that we call a routine called "**Setup_Game**". This would set up all the things that need to be done before a game starts. We then call "**Play_Game**" until we've run out of lives, and then show the HighScores.

If your program is well structured like this then it will be much easier to find bugs – you'll be able to find which section the fault is happening in and start to search that.

The moral of this story is: have patience. Spend the time to write your programs well. Badly written C turns to spaghetti, badly written assembly language turns into a strange jumble of numbers on the screen. Other languages turn into alien hieroglyphics.

Most well-written, well-organised programs debug themselves. Errors will be obvious and easy to find. For those bugs that you have problems with, the above-described techniques will help you to track them down. Programs written badly, like the example on page 29, are not so clear-cut. If a program in this style is longer than a few hundred lines, and you're faced with debugging it, you are in for a very, very unpleasant time. And you'll drink a lot more coffee than is good for you. **AS**

COMMODORE DEBUGGING TOOLS

Commodore supply a whole toolkit of debugging tools, example code and lots of other goodies, in a package called the Native Developer's Upgrade Kit, which is available from Commodore for the price of £25. Simply send a cheque for £25 made payable to "Commodore Business Machines Ltd" to: Developer Support, Commodore Business Machines UK Ltd, The Switchback, Gardner Road, Maidenhead, Berks SL6 7XA.

JARGON BUSTING

Assembler – An assembler converts assembly language source code into machine code instructions which your microprocessor understands. A disassembler, logically, converts it back again so you can spot bugs more easily.

Compiler – A compiler converts a high-level computer language into low-level machine code instructions which your computer can run.

Interpreter – An interpreter converts your high-level program into machine code as it runs, line by line. Many BASICs are interpreted, and ARexx is an interpreted language. Interpreted languages are slower than compiled or assembled ones, but are in general easier to debug because the interpreter is able to spot many errors that you may make before they are converted to machine code.

Machine code – This is the individual instructions that the central processing unit (the 68000-family chip) inside your Amiga actually understands. All programs that you run have to be written in this in order to work. Although you may write your programs in a language other than machine code, in the end this is what it becomes when it is finally run.

Source code – The program you actually write yourself, in assembly language or C or whatever it may be, before you run it through an assembler, compiler or interpreter to convert it into machine code for your Amiga to run.

CODING

AmigaDOS

COMMON QUERIES

PRINT ME

How can I print simple text files – scripts and "read.me's" – to the printer without having to go through a word processor?

This is simply achieved by using the printer as a destination device for a copy operation. You copy the file just as you would to any other device but specify the printer instead. For instance:

```
1>COPY DF0:Read.Me.First TO PRT:
```

Note: This only works with non-compressed text files. If the file has been packed with something like *PPMore* you will have to uncompress it first.

INVISIBLE PRINTER

I do not have a printer attached to my machine – is there any way I can prevent software from hanging up when I accidentally try to access the printer?

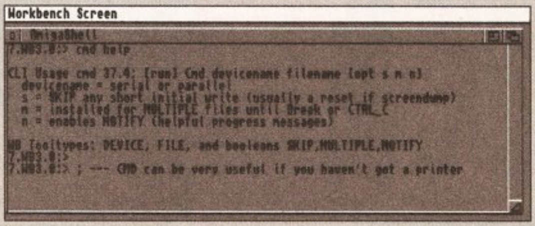
The safest way to solve this problem is to create a dummy printer! Let's assume your Printer Preferences are set up so the printer is attached to the parallel port. All you have to do is add the following command to your Startup-sequence (v1.3) or the end of the User-startup (v2.0+) and the printer will suddenly disappear! (Type this in as a single line, with a return only at the very end.)

```
RUN <NIL: >NIL: CMD Parallel NIL:
OPT M
```

That may look like gobbledegook – but it breaks down quite simply:

`RUN <NIL: >NIL:` Tells AmigaDOS to run the command in the background and to allow the current script to continue as normal – if this was not present the startup-script would halt and wait for something to happen.

`CMD Parallel NIL: OPT M` This is a special AmigaDOS utility which intercepts output sent to a port (the parallel port in this case) and sends it to a file. Output here is being sent to **NIL:** – oblivion! The last bit, **"OPT M"** tells CMD to keep going forever. In other words, you will never be aware of it.



CMD is a very odd command because it was written in C without any of the usual AmigaDOS niceties.

AUTO SCRIPTING

Is it possible to execute a script automatically without having to go through EXECUTE?

This is actually quite simple – from Workbench 1.3 you merely have to set the "S" protection bit using PROTECT like this:

```
1>PROTECT MyScript +S
```

Generally speaking, scripts will be stored in the **S:** assignment, so a more usual call would look like this:

```
1>PROTECT S:MyScript +S
```

An interesting feature cropped up around release 2/3, in that the "readable" flag is used. This flag determines whether a file can be read by AmigaDOS. This directly affects scripts because they are loaded by **EXECUTE** first and then interpreted. In other words, if the readable flag is *not* set, a script cannot be executed. AmigaDOS does not usually provide an error return in this case and will fail harmlessly.

This can give rise to confusion though: for instance, if you clear the readable flag on **S:Startup-sequence,** the machine will appear to boot as if the Startup-sequence was not there. For instance:

```
1>PROTECT S:Startup-sequence -R;
disable startup!!
```

Much the same is true for AmigaDOS commands, although these will generate an error, viz.:

```
1>PROTECT C:DIR -R
1>DIR
DIR: file is read protected
```

HANG ON

When I execute a command using RUN, I cannot close the Shell window until I close the command. Is there any way to prevent this?

This occurs because the startup code in the child command grabs the console handles of the current Shell window. In English, that's the place it gets its key presses from and sends its messages to. If the command is to be run completely in the background (or, for instance, it only uses Intuition) you can send it a set of dummy handles like this:

```
1>RUN <NIL: >NIL: Command
<arguments…>
```

A real example is the Freeware screen manipulator *Fenster,* which can be called like this:

```
1>RUN <NIL: >NIL: Fenster
```

READERS' QUESTIONS

WHERE ARE MY FDs?

Where can I get a copy of the .FD files for Workbench 2.x? I've looked at the files on my Workbench 2.04 disks but they are not there. I am currently programming in GFA Basic and therefore need them to access the 2.x libraries.
R Sutcliffe
Colne,
Lancs

Since Commodore stopped distributing AmigaBASIC, they also removed the .FD files too. These days you have to buy the Native Developer's Support disk set. It costs £25 for the four-disk set from Commodore Developer Support, Commodore Business Machines Ltd, The Switchback, Gardener Road, Maidenhead, Berks. ***MS***

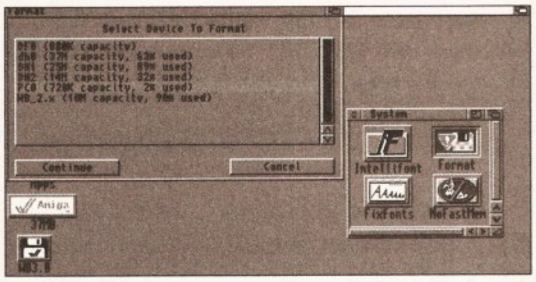
PC ZERO PROBLEM

My problem concerns accessing PC disks with *CrossDOS.* I have copied the icon "PC0" from the Storage disk to the DEVS/DOSDrivers, but when I click on the icon I get a requester stating "Mount Failure: Device PC0 already mounted". However, I still cannot access any data from a PC disk in the internal drive. What is wrong?
Kevin Ferguson
Sheffield

Nothing – *CrossDOS* works like that. When you copy a *CrossDOS* icon to the **DEVS/DOSDrivers** drawer, the machine automatically "mounts" the device during start-up. In other words, as soon as the Workbench appears, *CrossDOS* is running and ready for use – in theory anyway. By double-clicking on the icon you are attempting to mount a device that is already mounted (loaded and ready to go) and this is not possible. This facility is provided so you can mount devices manually (from the Storage disk for instance) without having them there all the time.

CrossDOS is not intended for use directly from Workbench, so you will not be able to access disks in that way. However, you can format a 720K PC disk by double-clicking on the **FORMAT** icon and selecting **PC0:** from the list. Once it is formatted in this way you will be able to access the disk from Workbench, although its icon appears twice as **"DF0:name"** and **"DF0:????".** (Presumably the same will apply to 1.44Mb disks on the A4000 machine, but I don't have the hardware to test this.)

A much more convenient and workable system is available from the Freeware program called *MultiDOS.* This performs exactly the same functions as *CrossDOS* in that you can read and write PC disks, but it is much simpler to use. *MultiDOS* enables you to access disks just like normal Amiga drives **(df0:, df1:** etc.) as well as providing its own device aliases: **MD0:, MD1:** and so on. More importantly, only one copy of the disk's icon appears on the Workbench screen as opposed to two when *CrossDOS* is being used.



Double-click on FORMAT from Workbench 2 onwards and you can specify any device, even a CrossDOS disk.

It is more usual to access a PC disk by using **"A:"** as a device name in file requesters and the like because the PC uses **A:** to refer to its first internal drive. You can accomplish this with *CrossDOS* very simply by changing the name of the

continued on page 36

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	50		1329			
160	-		1279			
214	-		1349		2089	
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85		389.99	404.99		
A600 HD 80	-	365.99	379.99	12 months return base	
120		415.99	429.99		
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CDTV MULTI MEDIA	Audio Discs/ CD Player, Keyb'd, Fdrive, Mouse, Remote Controller, Caddy, Welcome Disc, Fish Disc	229.99	244.99		Brickette £45
CBM 1084 ST	Tilt and swivel + leads	179.99		1 year	PiP Monitor to TV Converter – £99
CBM 1940	Leads. Ideal for AGA	279.99		1 year	
Philips 8833 II	Leads. T & Swivel £10	189.99		1 year at home	
Star LC100C	Top Value 9 pin colour printer	149.99	159.99	1year	
Citizen 240C	24Pin colour plus FREE PEN PAL	259.99	269.99	2 year	

Return to base HD versions are SD units fitted with top quality 3rd party drives and come with install disc + full documentation. *DPIII needs 2MB for animation on HD models.

A1200

1200 2MB	279
1200 +20MB HD	379
1200 +60MB HD	439
1200 +80MB HD	489
1200 +120MB HD	519
1200 +207MB HD	589
Extra 4MB + clock fitted	ADD £180

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1200s with hard drives include CBM approved drives fitted by CBM approved engineers, full legal installation/utility disc and documentation and come with CBM on-site warranty service.

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80 Prog. Hobbyte PD Greats Pack II 10 blank discs, mouse mat, 80 capacity lockable disc box, plus dust cover	Includes top games like Battlecars, Star Trek, Computer Conflict, Megaball, dozens of arcade classics, board classics and 'shoot-em-ups', Utilities, Word Processor, Spreadsheet, Database + Desktop Publisher and the ultimate virus killers - a must for every Amiga owner!

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Digita Home Accounts
Any Two Hot List Titles

WP with UK spell chck, Thesaurus spreadsheet, 'Sideways' utility, database, graphics + comms module Keep track of credit card and bank accounts, budgets, etc

THE HOT LI

GREAT individu packaged gam
BETTER THAN REST !!
(previous RRPs u £39.99 each
ANY 10 £29.
Or see packs across

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F1 Grand Prix - 92% A
Silly Putty - 90%+ lots of
Elf/Toki/Puzznic (counts a
Paperboy II ‡
Hunt for Red October
Colossus Chess @
Challenge Golf
Battleships classic board g
Graeme Souness Socc
Neighbours
Frankenstein ‡ @
Captain Planet
Silkworm Helicopter 93
Edd the Duck ‡
Stack Up ‡
Lemmings 92% AF
Round the Bend ‡
Continental Circus - 8 race
92% AA@
World Cricket
Bart Simpson
Spiderman/Cptn America
Ice Hockey
Xenon - C+VG Game of the
Blade Warrior - A Power, AF,
superb reviews
Toobin Rapid riding

‡ PARTICULARLY SUITAB CHILDREN (MAY NEED H
@ NOT A1200 COMPAT
TITLES MAY VARY

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*DPIII needs 2MB for animation on H

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icon from **PC0** to **A.**

Alternatively, the following assignment description (command line) can be added to your User-startup for the same effect using either system. If using *CrossDOS:*

```
ASSIGN A: PC0: PATH
```

Or if using *MultiDOS:*

```
ASSIGN A: MD0: PATH
```

HIGH DESTINY

I have recently bought an Amiga 4000/30 and have discovered that a cache of high-density disks I was using on my faithful A500 don't work on the new machine. Is there some sort of software patch I need to get around this?
Nigel Streeter
Maidenhead,
Berks.

Many people have suggested that it is a bad idea to format a high-density (2Mb) disk on a double-density (1Mb) drive. (On the Amiga this is 1.6Mb and 880K respectively; on the PC it's 1.44Mb and 720K.) The reason is that when you insert a disk in a high-density drive, the drive knows what sort of disk it is and configures the software drivers accordingly.

The standard Amiga drives do not have the extra hardware and treat a HD disk just like a standard (DD) type – formatting them to 880K. When you insert such a disk in an machine capable of reading HD disk – such as an A4000 – the machine attempts to read it as 1.6Mb and can't make any sense of the data.

The patch is very simple. Take a small piece of opaque sticky tape and cover the hole at the top left of the disk (looking from the front) – the extra one that isn't there on an ordinary disk. That will convince the machine that the disk is really DD and it will read it accordingly. ***MS***

SEA SHELLS

As an amateur just starting to learn that you don't hold the Shell up to your ear, I would find it helpful to print out crunched program docs. However, I am unable to get anything to print out. Can you help?
Duncan Fisher
Larkfield,
Kent

The problem with this is that it tends to rely on how the document was written and crunched in the first place. The two most common archiving systems are *LHArc* and *PowerPacker. PowerPacker* documents can be read (and I assume, printed) directly from *PPMore* – the *PowerPacker*-compatible text reader. However, it may be more convenient to decrunch the document first with *PowerPacker;* and more or less the same is true of *LhA.* Since packing programs vary so widely it is impossible to give general instructions which would adequately cover each one. ***MS***

WHICH VERSION?

1. Many disks, most notably cover disks, give the Workbench version as -1.0 when the "Workbench -> About..." menu is selected. Only the version 2.04 Workbench disk shows the correct number: 37.67 (even *DPaint III* shows 34.20). Can the correct version be displayed by a simple addition to the Startup-sequence? (Workbench and *DPaint* seem to achieve this by different methods.)
2. The LOADWB command on my Workbench disks is only 764 bytes long, whereas on all other disks it is either 2,784 or 2,804 bytes in size. Why is this? Could the shorter file be substituted and are there any advantages – except a saving in disk space?
3. Is the Fast Filing System worth using on my machine? I understand that disk access times can be reduced but that there is a greater risk of corruption occurring. Do the benefits outweigh the risks? If this is okay, how would I copy my Workbench disk in FFS format?
4. I have some older games which leave the drive light on and the drive motor whirring. Presumably this is thanks to bad programming, but will it significantly reduce the life of my drives?
Alfred Bolton
Darlington
Cleveland

1. How observant of you (and shame on me for not noticing that one!). The reason the Workbench version number is displayed incorrectly is that it cannot locate some software on its boot disk – the "version library" (surprise, surprise). All you have to do is copy that to the correct place on each boot disk and away you go! Here's how to do it from AmigaDOS after booting the correct Workbench and opening a Shell. (The ☛ symbol means keep typing to the end of the *next* line.)

```
1>RESIDENT C:COPY; make ☛
copy resident
1>COPY LIBS:Version#? TO ☛
RAM:Libs; duplicate it
```

Now you can execute the following command on every offending disk (provided there is enough room, of course). Just insert the disk in the internal drive and enter this:



When the version library is missing, Workbench behaves very stangely! It's always the simple things...

```
1>COPY RAM:Libs TO DF0:Libs ALL
```

2. The file is smaller in release 2 because it has been re-coded to take advantage of extra facilities in the Kickstart ROM – it actually gets slightly bigger again in release 3! The advantages? Well, the new command has options which can affect the Workbench directly. The most useful of these is **CLEANUP,** which performs an immediate "Window Clean Up" of the Desktop as soon as the machine boots – or at any other time if you Quit Workbench and execute this from a command line. Example:

```
LOADWB CLEANUP
```

3. That is a very good question. I think you are better off sticking with the original filing system (OFS). Although the FFS does have the benefit of speed and increased storage capacity, it does suffer with redundancy problems. The great thing with OFS is that it's backwardly compatible with older machines – and this is great for portable media, such as a floppy disk!

While I'm on the subject, let's get this data redundancy argument into perspective. FFS tries to write contiguous 512-byte data blocks, whereas OFS writes 488 data blocks, not necessarily in contiguous segments. If one single block of an executable file goes wrong: it's dead, kaput, extinct – no matter what filing system it's running under. More or less the same applies to data files unless they happen to be ASCII, in which case you might be able to patch them back together.

The redundancy argument over OFS is often exaggerated. In practice, it is easier for a disk recovery program (such as Dave Haynie's *DiskSalv)* to salvage something because it can track the files more easily over the surface of the disk; and since disks may go down a track at a time, contiguous blocks are like leaving all the eggs in a single basket. In the end, though, there's no replacement for regular backups. 'Nuff said?

4. It is bad, or rather lazy, programming that gives rise to this, and no excuses about software protection will convince me otherwise. The drive motors are not in any danger of wear – they could run continuously for months at a time I suspect; only the rubber belt is at any real risk. However, the drive heads and especially the disk surfaces will be subject to excessive wear and games that do such things should be avoided – especially considering that the software "protection" causing it prevents you from making redundant backups. ***MS***

JARGON BUSTING

AmigaDOS – Amiga Device Operating System. On most machines the acronym DOS is taken to mean Disk Operating System but DOS provides access to all the Amiga's physical and emulated devices – disks are just one area of operation, though admittedly an important one.

Mounting – The process of loading some device-specific software (a handler) and running it as an AmigaDOS process. This technical stuff is handled automatically by the system's **MOUNT** command and is nothing to worry about. A disk device (or filing system) is said to be "mounted" when a disk is loaded in the drive and ready to be accessed.

Script – A list of AmigaDOS instructions executed just as if you had typed them in the Shell. Scripts automate many long-winded procedures, from copying groups of files to compiling programs.

Startup-sequence – A sequence of AmigaDOS commands the machine executes every time it is booted from a valid AmigaDOS boot disk. The startup-sequence is called automatically by the system at boot time, and while it is optional, the machine will not do much without it.

User-startup – From AmigaDOS 2, this is an additional startup-sequence reserved for user instructions such as assignments and extra device mounts. Modifying the main Startup-sequence is now considered bad karma.

HARDWARE

Memory

COMMON QUERIES

CHIPS WITH THAT?

What is the difference between Chip RAM and Fast RAM?

There is no real physical difference between Chip and Fast RAM – the difference is determined by, and specific to, the Amiga. The Amiga's custom chips have a very limited addressing range – between 512K and 2Mb, depending on the machine, but the 68000 chip, the central processing unit (CPU) fitted to even the lowliest models, can access far more than that.

Chip RAM is shared between the custom chips and the CPU; Fast RAM is memory which can be accessed only by the processor. Since Chip RAM is in very short supply, the operating system always tries to load programs and non-Chip data into Fast memory. It does not make a lot of difference in speed, but leaves Chip free for other software.

TIPS: If you have a base Amiga A500 Plus or A1200 you can increase the amount of Chip memory available to applications by switching the Workbench screen into two colours only. This works even if extra Fast memory is fitted. ***MS***

THE TRAPDOOR

What is the difference between trapdoor expansions and the ones that come with hard drives?

The trapdoor is included with the lower-end Amigas so that an extra memory daughter board can be fitted to the main PCB quickly and easily by anyone. For the A500, the connections at this position enable the machine to treat the expansion like extra motherboard RAM (512K or 1MB depending on the model) with the optional addition of a battery back-up real-time clock.

Many third-party designers have produced compatible boards although some do not come with a battery-backed clock. Unless you own an A500 Plus or A600, which have clocks as standard, you're better off avoiding one of these.

The sort of memory on the board will depend on the kind of Agnus chip inside your Amiga. On most machines the memory will be split with half going to Chip and the rest to Fast. On later models the memory will be accessed as 1Mb of Chip. The only way to determine what configuration you have, other than taking the machine apart, is to run the system command **AVAIL**, which will show how much memory is fitted and what type it is.

The A500 Plus is different – not least in that it can accept either the old 512K trapdoor expansions (provided they are fully compatible with the A501) or a revised version with 1Mb RAM: taking the machine to 1.5Mb or 2Mb in total respectively. On the A500 Plus this memory is always accessed as Chip RAM.

Fast RAM is available from any expansion fitted to the bus expansion connector located under a plastic cover at the left edge of the A500, A500 Plus and A600 (Fast RAM is added to the A1200 via a trapdoor expansion). The bus expansion is a simple edge connector which goes directly to the data and address buses; plus a few other signals – it is *not* the same as the Zorro expansion slots found in the larger Amiga machines or the PCMCIA slot located in the same place on the A600 and A1200.

Electronically this slot is very "close" to the Amiga's hardware and any expansions fitted to it have to do a lot of work, making them expensive. Additionally, providing a "through" facility is very difficult to implement since any additional hardware will assume it has exclusive control of the bus. (Supra's 500RX 8Mb expansion fell foul of this problem and does not work with some A590s.)

Several designs have been suggested to add extra parts to this slot, some for hard disks others for memory only, but the most popular (and probably the best overall value) are those offering both. A typical example is the highly prized GVP Impact series: which can accept up to 8Mb RAM and typically comes with a 52Mb drive. (Note however, the GVP design uses custom SIMMs that make it expensive to upgrade to 8Mb.) Other manufactures, notably Roctec, produce a bare case without drive or memory so you can fit what you want when you want it. ***MS***

MURKY MERGES

What does MergeMem do?

MergeMem searches the memory map for expansion memory and compares it to the current memory list. If, for example, two boards had been allocated 2Mb slots each by Autoconfig™ then the memory list would show two 2Mb areas of memory rather than a single 4Mb one. MergeMem checks if these boards have been allocated next to each other in the address map: for instance if one stops at 7FFFFF and the other starts at 800000 then MergeMem will "connect" these in the memory list. ***MS***

MISSED THE BUS?

What difference does a 32-bit bus make? For instance the A500 has a 16-bit bus and the A1200 and CD32 have 32-bits. Why?

Computers don't just work by addressing single bits at a time – that would take too long. Instead, the CPU reads or writes many bits at a time from each memory location, the exact number being determined by the width of the data bus – and

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READERS' QUESTIONS

BIG FAST CRASH

About 18 months ago I installed the Power Computing 1.5Mb expansion to my A500 and made modifications to the motherboard to access 1Mb Chip and 1Mb Fast RAM.

Three months ago I upgraded the machine with a 2.04 ROM to be greeted with a string of failures. After removing the modification to return the machine to 0.5Mb Chip and 1.5Mb Fast, everything returned to normal – although I still need the extra Chip memory. Is the board simply incompatible with Kickstart 2?

Marlon Ward Rhan
Rio De Janeiro,
Brazil

I have not come across this problem but I suspect you are not alone. After some discussion with colleagues, the consensus of opinion is that the cause is the differences between Kickstart 1.3 and Kickstart 2. When Power Computing designed that board, the A500 Plus did not even exist and it was not designed to work with later machines. This is, I'm afraid, the price we pay for fiddling with the internal architecture. If you need this much Chip, you may be better off selling the machine and upgrading to an A1200, which has more RAM in the first place. ***MS***

BACK TO BACK

I have an Amiga A500 with 1.5Mb in the trapdoor made up of two boards mounted back-to-back. One has a clock, the other has an on-off switch and a jumper vanishing into the guts of the machine. Can I add another board between these two?

R J Ashworth
Bolton,
Lancs

The simple answer is no. Even if you had enough space to add another board in the trapdoor, the machine would not be able to address it. Such boards are "illegal" patches anyway. The simple answer is to add extra RAM externally on the expansion bus that was designed for the job. ***MS***

MORE RAM PLEASE

I have a 1Mb A500 and plan to take the machine to 2Mb and more in the future. However, I am puzzled about how to make the upgrade. My current solution is:

- **add a 1.5Mb RAM board;**
- **add a 2.04 Kickstart ROM;**
- **add a ROM switch to enable 1.3 and 2.04 operating systems.**

I have a couple of questions about this solution.

1. The adverts I have seen for the 1.5Mb RAM board state they can be used with an existing 512K upgrade; will it work with an A501?

2. What is the Gary chip and would I have to buy anything else to go with this?

3. Is the ROM switcher worthwhile? I understand it will allow me to access either Kickstart 1.3 or 2.04 – is this correct?

4. If my solution is unworkable can you suggest something that would be acceptable?

Nick Urch
Horfield,
Bristol

1. The piggy-back RAM expansions were good in their day, but their time has expired. In any case, if you have a genuine A501 expansion in the trapdoor, there will not be enough room to fit one. They only work with the small (4-chip) expansions and not the older 16-chip designs.

2. Gary gets its (his?) name from the abbreviation Gate Array. The chip, which does not officially form part of the famous PAD custom chip set, is another custom chip manufactured by a Commodore subsidiary. The chip handles all the address decoding and provides general "glue" for the system. Some manufacturers noted that it was possible to borrow an

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the wider the data bus, the faster the computer will run. For example, if the data bus is 8 bits wide (that is, the computer is an 8-bit machine), it will take four successive reads to read four bytes of information.

The 68000 chip in your Amiga has a 16-bit data bus, so it reads the same amount of data in half the time. Internally, however, the 68000's data registers are 32 bits wide – which is why it's sometimes referred to as a "16/32" machine (16-bit data bus, 32-bit internal bus). Accordingly, to fill a data register the 68000 must read memory twice, first collecting the lower 16 bits, then the upper 16. The 68020 chip (fitted to the A1200 and higher-spec Amigas) and above have 32-bit data buses which can read longwords in one munch – but this only works if the actual memory is also 32-bits wide. ***MS***

A MATTER OF TIMING

What does the term "access times" mean? And what are wait states?

The access time of any RAM chip is the maximum time taken from a valid address appearing on the address bus to valid data appearing on the data bus. Just to add to the confusion, DRAM chips have a secondary memory cycle time. In other words, you can't read a bit, then read another bit straight away. A typical 120nS Hitachi DRAM requires a complete memory cycle of 220nS. Such DRAMs are typically used in the Amiga A500 series, and this leads to some interesting headaches for the designers of accelerated processors – the RAM can't keep up with the processor and you get wait states.

These are one of those nightmarish problems designers always try to avoid – although that isn't always possible. The Amiga's internal clock is a square wave running at 7.14MHz. The frequency of any waveform is given by the equation F=1/t, where F = frequency in Hertz (Hz) and t = time in seconds for a complete cycle. One cycle is the time taken for the clock to traverse from ON to OFF and back to ON again. Therefore, for this example it follows:

T = 1/71400000Hz
T = 140nS

Every time the clock level changes (low-to-high or high-to-low) a new state begins, so for every complete clock cycle there are two states. The CPU uses states to internally time certain events such as when certain signals are sent to the peripherals. In so far as RAM is concerned, the 68000 allows four complete states (two clock cycles) for valid data to appear on the data bus. (Gary indicates this by taking DTACK low.)

If the RAM does not respond within that time (280nS), the 68000 halts external processing and generates "wait states". Every wait state lasts a complete clock cycle, so if Gary signals DTACK on an intermediate cycle, half a wait state is generated. This leads to some systems described as "1.5 wait-state". In practice it never happens in the Amiga, apart from when there is heaving DMA or you add a bus-sharing accelerated processor like a 16MHz 68000 or an AT-Once Plus 16MHz 80286.

The total normal read/write cycle on the 68000 takes eight states (four clock cycles) – or 560nS. But the custom chips steal about half those (when accessing Chip RAM), leaving a total cycle time of 280nS. Since the DRAM responds in 220nS – well inside that total cycle time – wait states do not occur. Add lots of DMA contention (lots of colours being used on screen for instance) and the custom chips start to get cycle-greedy and pinch extra cycles.

This is why Chip RAM is sometimes slightly slower than Fast RAM. Interestingly, an American publication called *DTACK Grounded* specialises in cavalier, high-speed 680x0 designs in which data is always available when it's called for. The quest for speed goes on... ***MS***

addressing line from Gary (via a simple adapter) and cheat the machine into thinking there is some extra RAM in the trapdoor. Like all patches this is unofficial and cannot be guaranteed to work properly with later revisions.

3. Personally, I think that if you want 2.04 you should stick to it. The 1.3 fallback mode provided by ROM switchers is reliable enough but it only benefits games.

4. Be compatible. Use the machine in the way it was designed and you're less likely to suffer from compatibility problems. The A500 has an external expansion adapter which was supplied to accept specially designed hardware such as RAM and hard disks. ***MS***

MORE GRAPHICS MEMORY

I have an Amiga 1200 which when used for video titling and graphics frequently runs out of memory. Is it correct to assume that more Chip RAM and not Fast RAM will increase the graphics memory? If so, where can I get more graphics memory for the A1200? The advertisements I have seen only offer Fast RAM, either on internal modifications or PCMCIA cards. I do not need to speed up the processor.
Derek Hicks
Cane End,
Reading

There is good and bad news here. The bad news is you cannot increase the amount of graphics (Chip) memory because the machine is only capable of addressing 2Mb. The good news is: the applications you are running are also pinching a lot of your graphics memory. In fact, by preference the machine will always load applications into Fast (expansion) memory unless there is not enough to satisfy requirements. In other words, if you fit another 2Mb in the expansion slot, that memory would be used for your applications, leaving the majority of Chip memory free for screen displays. ***MS***

JARGON BUSTING

A590 – The only official hard disk/RAM expansion ever produced by Commodore for the A500 machines. The standard machine comes with a 20Mb hard disk and room for up to 2Mb of extra memory.

Address – A number representing a single location in memory.

Agnus – Probably the most famous (certainly the most talked-about) of the Amiga's custom chips. This one contains the copper, blitter and DMA circuitry.

AutoConfig™ – A clever system by which the Amiga "wakes up" expansion boards at startup (or after a re-boot) and examines them for their configuration. Each one is then allocated a slot in the memory map, according to its own particular requirements. Neat trick!

Denise – This custom chip is largely responsible for the display – it contains the colour palette, sprite drivers, video output.

DMA – Direct Memory Addressing. A system where the RAM is accessed when the processor is "sleeping" processing instructions.

MMU – Memory Management Unit. A device for controlling how memory is accessed by the CPU. An MMU will have complete control over the data and address buses and can provide virtual addressing in multi-tasking systems.

PAD – The collective name for the Amiga's three main custom chips: Paula, Agnus and Denise. They take over some tasks from the CPU.

Paula – One of the Amiga's custom chips; controls the floppy disk drives and hardware interrupts and produces the famous Amiga sound.

Propagation Delay – The time it takes for an electronic signal to travel through an electronic circuit, usually a logic gate. This is caused because transistors take time to react, and at the speed of modern computers even the odd nano-second is crucial.

RAM – Acronym for Random Access Memory. All memory is random access, but this type can be written to or read from. In other words it is the temporary storage used when the machine is operating, and its contents are lost when the power is switched off.

ROM – Read Only Memory. Also called permanent memory. This type of memory is usually used to hold the operating system, since its contents are not erased when power is removed.

SIMM – Single In-line Memory Module. A set of surface-mounted memory chips pre-mounted on a small PCB with an edge connector, making extra memory simple to fit.

Trapdoor – A special slot underneath the A500 machines designed to accept a memory expansion of 512K; and later 512K or 1Mb. This memory is mapped as Fast memory on early machines and Chip on later models or those fitted with Fatter Agnus.

Unpopulated – A board described as unpopulated has space for extra RAM which has not yet been fitted.

HARDWARE

Hard Drives

COMMON QUERIES

SHOULD I GET ONE?

Should I fit a hard drive to my A1200? What are the advantages?

You should. Fitting a hard drive is a fairly straightforward operation – described in depth for the A600 and A1200 in *Amiga Shopper* 23 (you can order a copy on page 116 if you missed it) – though you might want to leave it in the hands of someone who does it professionally. Once it's done, your machine will never be the same again. Apart from the usual advantages of being able to store far more data and access it without shuffling through stacks of floppy disks, Workbench will load in a matter of seconds rather than minutes and you will no longer be plagued by those dreaded requesters demanding that you "Please insert volume Workbench 3 in any drive". ***MS***

WHAT ABOUT THE WARRANTY?

I want to add a hard drive to my A1200 but I do not want to invalidate the warranty. Is there any way around this problem?

A couple of authorised Commodore suppliers can fit an internal hard drive for you and reinstate the official warranty stickers. However, you might want to consider the latest innovation: an external hard drive. These things are so new that very few details exist so far, but they are claimed to be fully compatible with existing software and come ready cased with power supply and plug into the existing PCMCIA slot. Buyer beware though: there is no throughport for existing RAM or Modem cards.

Typically a 40Mb model with 2Mb per second transfer should set you back about £169 and a you'll still get change from £300 for beefy 170Mb. Call Software Demon (☎ 0736 331039) for details. They are also offering a version for the parallel port (of all things) at £199 for 40Mb. ***MS***

CDTV HD?

I have an Amiga CDTV computer which is supposedly based on the Amiga A500. I would like to add some form of hard drive. Is it possible to fit an A590 to a CDTV?

The CDTV is based on the A500 but that's where it ends – and it does not have an external expansion bus like the one found on the A500. However, any external SCSI hard drive such as RocMate should do the job. If you want to stay with the black colour scheme Indi Direct (☎ 0543 419999) have something to fit the bill. The 85Mb version rolls in at around £220 – not cheap, but it should be adequate. Remember also, such drives do not include extra memory capability as you would find in the custom A500 expansion designs. ***MS***

PROTECTED, RIGHT?

I can write-protect my floppy disks by simply moving a plastic cover – how can I prevent accidentally writing to the hard drive?

Generally speaking, hard drives are meant to be read/write all the time – the thinking being, why would you want to write-protect them? Of course you might – although you can only do this from the AmigaDOS command **LOCK**. If you wanted to write-protect the hard disk partition **dh1:** you would enter:

```
1>LOCK DH1: ON
```

Similarly, to remove the write-inhibit, enter this:

```
1>LOCK DH1: OFF
```

The command also enables you to enter a four-letter password – for instance:

```
1>LOCK DH1: ON PSWD
```

The lock cannot be removed until the correct password is entered. If that sounds wonderful, it isn't. The lock is only valid for AmigaDOS commands and will not affect a virus randomly writing to the surface and destroying the filing system information. Also, the lock is only valid until the machine is re-booted, and although it could be added to a "Startup-sequence" it wouldn't take a genius to work around. If security is a problem, the best thing to do would be to clear the "automount" flag in the required partitions *(not*

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READERS' QUESTIONS

FIXED DISK ISN'T!

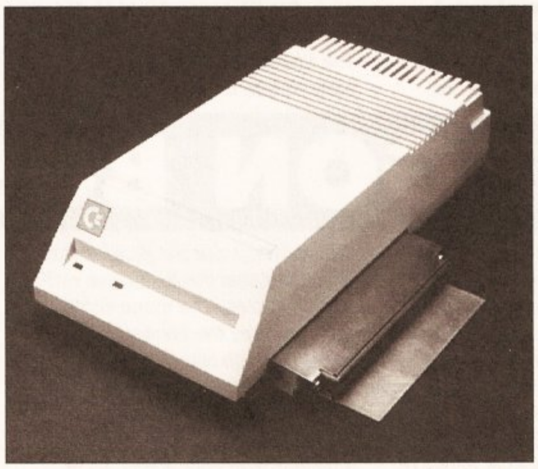
I have a KCS Power PC card in my Amiga 3000, but I cannot get the MS-DOS program FDISK to recognise my hard drive. I have tried all combinations of the software and overlays – but nothing seems to cure the problem.
Peter Reynolds
London N1

According to those in the know at KCS, there is a bug in the MS-DOS 4 FDISK program which prevents it from working correctly (or at all) with a hard disk emulation since it makes certain assumptions about the drive. The only solution, therefore, is to upgrade to a later version of MS-DOS such as 5 or 6. ***MS***

EXTERNAL HARD DRIVE

My A590 has been upgraded with a 52Mb SCSI drive, but I find I am still continually running out of space. I have heard that it is possible to add another SCSI device to the port on the back, but where can I get one?
John Roche
Sunderland
Tyne and Wear

Up until quite recently these devices were few and far between: there was no shortage of drives, but no-one had married them with a decent power supply, case and leads to form a complete package. Fortunately, Roctec have realised that there is a market for these devices and produce a complete unit retailing at £199 for a 42Mb drive (contact Silica ☎ 081 309 1111). This should be compatible with all hard drives that offer a SCSI through-port including the GVP series and upgraded Roctec RocHards, to name just two.



The A590 external hard drive is the standard add-on hard drive for the A500 – just plug in and go!

HARD DRIVE SYNDICATE

All was well until I installed *Syndicate* on my hard drive and from then on whenever I reset the machine it takes about twice as long to load up Workbench and the hard drive light stays on. After about a minute it settles down and everything appears to be alright. However, this problem does not occur every time I switch on and even occurs after the machine has been switched off for several hours. Help!
P Reynolds
Coventry

This sounds like the machine is trying to validate the hard drive when you switch on. It is not uncommon for this to happen if something was writing to the drive when power was removed, although normally I would expect it to go away once the validation had completed.

It may be something has botched the structure of the disk somehow – perhaps the installation of *Syndicate* (although that is by no means definite). You should be able to fix this by running the hard drive though a diagnostic/repair program such as Dave Haynie's *DiskSalv*. Failing that, make a backup of the data on the drive and re-format it. ***MS***

APPLE? MY EYE

I recently acquired an Apple CD 150 CD-ROM drive for use with my Macintosh SE. While it works fine on the Mac (via SCSI) it does not seem to work with my GVP A500 Plus HD. The system boots with the CD ROM attached but will not recognise the presence of a CD.

I think I need to mount the drive as CD0: and this will need a mountlist entry. I have tried using trial and error but everything just locks the machine. What would be a suitable mount entry? Or do I need a special device driver?
Barnabas Swain
London W2

I think the problem is this: SCSI is a generic standard that allows a CPU to talk to a named SCSI device. However, each device responds to a set of commands defined by its manufacturer – that's what the handlers in mountlist entries do. The short answer, I fear, is that the Apple

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boot partitions) and mount them manually when required. ***MS***

TO DMA OR NOT?

While shopping around for a hard drive, I have noticed some of the specifications mention something called DMA – what does this do?

DMA or Direct Memory Addressing is a system where some hardware shares the address and data buses with your Amiga's central processing unit or CPU (which will be one of the 68000 family of chips). A DMA hard disk controller is designed to read information from the hard disk and write it to RAM while the processor is busy processing instructions and has relinquished control of the buses.

A non-DMA design does not use any of these fancy tricks and uses the CPU to copy data from the hard disk directly to RAM, which means it has to wait until the CPU is free to do so. In theory, therefore, a DMA design should be a lot faster than the non-DMA equivalent. In practice, though, since the Amiga's custom chips make heavy use of DMA themselves there is little to choose between the two. Moreover, the non-DMA designs, since they use the CPU, are more compatible with unusual add-ons such as processor accelerators. ***MS***

PART TITIAN?

The software that came with my hard disk has an option to partition the drive. What does this do and is there any advantage to it?

Partitioning is a process where a physical device is split into two (or more) logical devices. There are a number of reasons you might want to do this, but the most common one is purely for convenience.

Let's imagine you have a single hard disk attached to the system – this is the most common setup. If that drive has a capacity of 52Mb and a single partition, then it will appear on the Workbench as a single disk. If you split the drive into two "partitions" then Workbench will treat each one as if it were a separate disk with its own identity. This is all carried out at a very low level and it is possible for each partition to have its own parameters and filing system. For instance, under Workbench 3.0 you could have one partition using the new Fast Filing System and another not.

More importantly, with later Kickstarts, you can determine during startup which partition to boot the Amiga from. This allows you to have two different Kickstarts in the same machine and automatically boot from the correct Workbench. If you take this route, however, the Kickstart/Workbench 1.3 must be the first one on the drive.

Other uses for partitioning are for data security. The partitioning software should allow you to auto-mount each logical partition at boot time – which is default – or to mount it manually afterwards. You might use such a scheme to keep a 52Mb disk divided so all the leisure titles were visible on the main partition and the important applications and work were squirreled away somewhere safe on an invisible partition. This would allow the kids to play games without any chance of them deleting weeks of work. ***MS***

POOR PARKING

A friend told me I should always park my hard drive before I switch off the machine at the end of a session because otherwise I could damage the surface of the disk. Is this true?

Park utilities are meant to move the drive heads away from the sensitive surfaces of the disk, primarily to avoid damage during transport. What's more, early Amiga drives such as the 20Mb Epson-XT models fitted to the A590 could suffer from glitches if the heads were positioned over the disk when power was applied. This could be avoided by parking the disk heads with the supplied utility before switching off.

Modern drives, however, are designed to auto-park when power is removed in any case, so there is no need for you to park the heads manually. Moreover, using a park utility on a drive it was not designed for could damage the drive by telling it to go to a cylinder that does not exist. Therefore, if your drive was supplied with a parking utility, use it; if not, don't. ***MS***

CD drive was meant to work with an Apple machine and will not work on your Amiga – unless you feel up to writing your own device handler. ***MS***

POWER TO THE DRIVE

I recently bought an A1200 and wish to add a hard disk.
1. You state that a 3.5-inch IDE drive has a 40-way IDC cable and separate power connector. Is there no way of obtaining the 12V supply from the parallel port or even an external supply so that such a drive could be used?
2. Can I remove my internal floppy drive and replace it with a half-density drive or would it require an interface?
3. Just below the parallel port there is an IDC connector with a white cover on it. What is it for?
J A Ettles
Bury
Lancs

1. There are 12V lines hanging around in the machine but it would be unwise to use them to power something like a hard drive in case the PSU – or worse, the PCB – gets overloaded and burns out. In theory it is possible to use an external power pack, but this would result in a rats' nest of cables rendering the machine difficult to move and inherently unreliable.
2. Do you mean a high-density drive? As far as I know at this stage the A1200 does not support HD drives in hardware and the simplest method would be to get an external HD drive like the XL Drive, £99.95 from Power Computing (☎ 0234 843388).
3. If we're thinking of the same thing, that connector was only fitted to early production models of the A1200 and is a white elephant. ***MS***

CHAINING HARD DRIVES

How can I daisychain two A590s together? On the hardware side I've used only one controller and connected the other drive to the spare internal XT connector and spare power (I had to solder in extra 40-pin and 3-pin connectors to the controller board). I then changed the position of the jumper on the spare drive. However I am stumped by the software side of things. At present the system will boot up but not recognise either of the drives, so what changes do I have to make, using the set-up disk?
Jonathan McClelland
Bangor, N Ireland

This is a hardware, not software problem. First, you should only use one XT connector on the board – the space for the other connector and the other power lead are not spare for you to solder on to, but depend on which drive is supplied with the A590. With the Western Digital 20Mb drive, the XT connector is on the right and the power connector on the left. The Epson 20Mb drive supplied with early A590s is the opposite way around. This is the only reason the board has two possible connections for power and XT drive.

To run a second XT drive you have to make a 40-way ribbon cable with three 40-way connectors on it, plugging one end into the A590 XT connector and the other two ends into the two XT drives. You then have to change the jumpers on the XT drives so that one is set to master mode and the other is set to slave. This again will depend on which type of drives you have. Finally, you'll need an external power source for the other XT drive – the A590 only provides enough power for one drive. How about buying a chainable drive? See "External Hard drive" above. ***JR***

JARGON BUSTING

A590 – An early (and much-maligned) hard drive expansion for the Amiga A500, supplied in two versions: with either an XT-IDE drive or a SCSI unit of 20Mb capacity. Many have been quick to criticise the A590 but it is a solid and reliable unit with a SCSI controller on board which can accept drives of 100Mb or more.

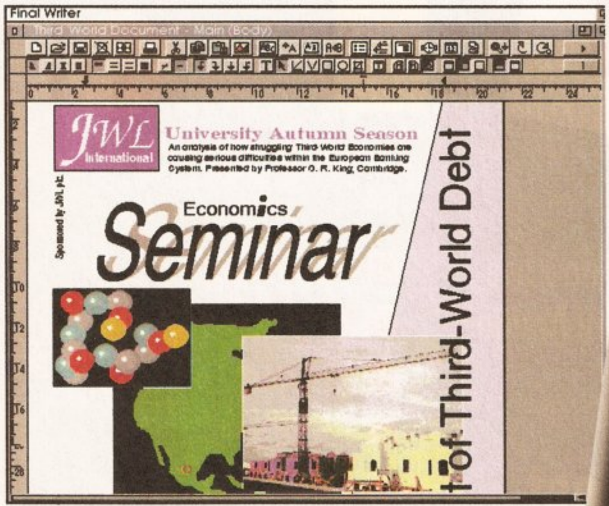
DMA – Direct Memory Addressing. See the question headed "To DMA or not" in the box above and the section on memory, pages 37–38.

IDC – Insulation Displacement Connector. A special plug/socket designed specifically for use with ribbon cables. The name comes from the way the connector assembly "displaces" the insulation around each wire and connects to the core. The operation is completed in one go and is far more efficient than connecting 40 or more wires by traditional soldering. The "ScotchLock" commonly found in car spares shops uses the same principle to tap power wires in automobile electrical systems.

IDE – Integrated Drive Electronics. A PC standard system for hard disks lately employed in the A600, A1200 and A4000 machines.

SCSI – Small Computer Systems Interface, pronounced "skuzzy". The interface allows high-speed, bi-directional data transfer between a CPU and up to seven peripheral devices. SCSI is most often used for mass storage devices such as hard disks, tape streamers and CD drives; but it has also been used for image scanners and even printers. A SCSI interface is only standard fitting in the A3000 and as an option card in the A1500, A2000 and A500 machines.

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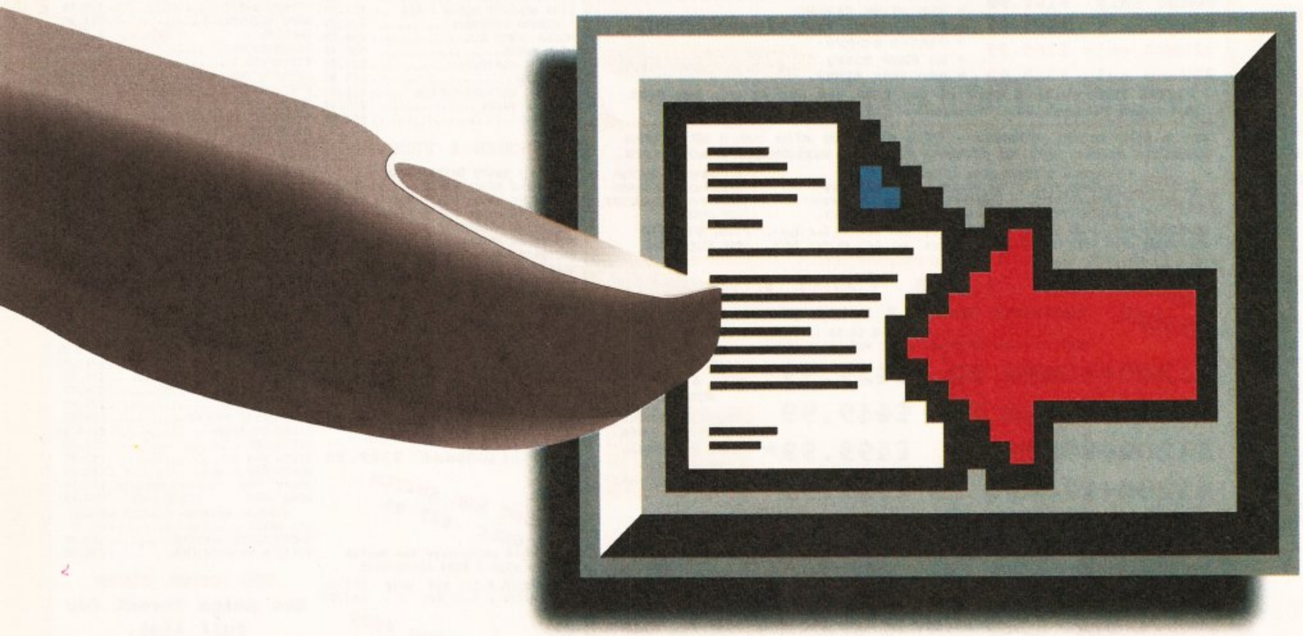
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SOFTWARE

Business

COMMON QUERIES

FLATLY DIFFERENT

What is the difference between relational and flat-file databases?

A relational database can link two or more flat-file databases together and extract data from one based on the contents of the other. A flat-file application can only operate on the contents of one database at a time – although it may be able to open many at the same time. This means that relational database are more powerful than flat-file – but not everyone needs relational facilities.

A RELATED QUESTION

I need a database for use in my business. How would I know if need a relational database?

The primary advantage of relational databases is their ability to access data from more than one file. Typically, this means that commonly-used data can be stored separately from the main database and only accessed when required. (Experts usually call this graveyard data.)

Take an example. Imagine you had a database of credit customer accounts. Each time a customer orders something, you need to create a record. This record has to contain the customer's details, the item(s) they bought, the date and the price invoiced. This record can be split into two parts:

- The customer's details.
- The items, price and date.

The customer's details never (or rarely) change – this is the graveyard data. The separate orders are subject to change: every time a new item is ordered, a new record has to be created.

Now consider this: in a flat-file, every time a new item is ordered the customer's details have to be entered, and clearly this is incredibly inefficient both in terms of storage and entry time. Moreover, if the customer's details change, someone would have to go through and modify every single record.

If the customer's details could be stored in one file and the accounts in another, then all you would need is a reference in the accounts file to indicate which account records refer to which customers. Because only one copy of the customer details is kept, any changes only have to be made once: they will automatically affect any record in the accounts file.

Almost all large-scale databasing is performed using relational applications. A bank, for instance, refers to each of its customers by an assigned account number. One master file will contain all your details and any transaction you make can be traced back by referring to the account number. ***MS***

COLOUR CELLS

Is it possible to colour negative cells in the *Advantage* spreadsheet automatically?

Unfortunately no. This is a shortcoming of the package (it does have one or two). However, there is a solution. Just work out which cells you want to colour when they go negative and enter a formula like this, all as one line, nearby (right below is a good place to start):

```
=SETCOLOR(Test,Colour1,☛
Colour2,Apply to Cell)
```

For instance if you wanted to change the colour of A39 when it goes negative, you could enter the following in A40:

```
=SETCOLOR(A39<=0,1,3,A39)
```

Note that you are not constrained to changing the colour of the cell reference that has changed and you could use such a feature to check a cell which is out of view, say Z90, and "turn on" an error message in A1. For instance:

```
=SETCOLOR(Z90=0,1,3,A1)
```

You will find more details on this in *Advantage's* documentation. ***MS***

SPREAD MY WINGS

I want a program to help me with accounts. Will a spreadsheet help?

Spreadsheets are very much an open application and therefore tend to be tricky to use – they have to be programmed to do anything. If accounts is what you are looking for then a custom accounts package is much simpler to use. A prime example is *Home Accounts 2* from Digita (☎ 0395 270273).

READERS' QUESTIONS

SPORTY DATABASE

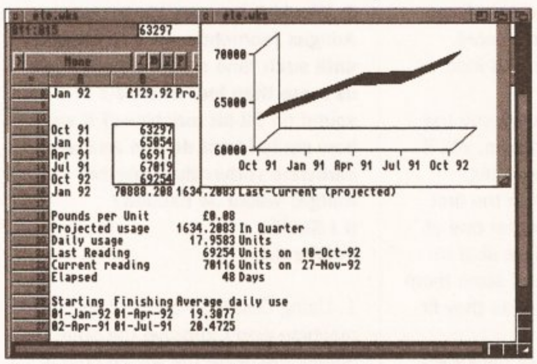
I am looking for a program where I can store sports results for golf and football. I would like a program that is capable of working out averages and performing simple calculations. Can you help?
Edward Cadden
New Stevenston,
Motherwell

The sort of functions you describe are quite simple and most of the widely available databases can perform these. Although my personal recommendation would be *Superbase Personal 2* (by Oxxi-Aegis, available in the UK from Meridian Software Distribution ☎ 081 543 3500), you may like to get details of the following British systems, which, while less powerful, are a good bit cheaper. ***MS***

- *PowerBase 3.30* (a simple, memory-based, flat-file): £14.95 from Dept AS, 1 Cherrington Drive, Great Wyrley, Walsall WS6 6NE. ☎ 0922 414731.
- Order 2.05 (a basic, memory-based, relational): £29.95 from South Hams Software, 2 Ford Road, Torre, Yealmpton, Plymouth PL8 2NA. ☎ 0752 880906.

WIDE BOY SPREADSHEET

I am looking for a spreadsheet which provides at least 75 rows, room for 30 characters in the left-hand column and a further 12 columns for monetary values. It would also be useful if entries could be made to appear in different colours. I know that *Professional Calc* is highly recommended but does it offer this? It is quite expensive too, so is there a cheaper alternative with these facilities?
G Piper
Walton-on-Thames,
Surrey



Gold Disk's Professional Calc (above) is powerful but pricey. Office Calc is a usable stripped-down version.

Spreadsheets are few and far between on the Amiga but several will reliably fulfil your requirements. *Professional Calc* is by far the best and the most expensive too – £150 from Silica ☎ 081 309 1111. *Pro Calc's* predecessor, *The Advantage*, is no longer on sale but you may be able to find a copy if you shop around. *K-Spread 3* (Kuma/HiSoft) and *Superplan* (Oxxi-Aegis) are dated and difficult to use. Micro Systems Software's *Analyse* is now sold as part of *The Works! Platinum* and offers extremely good value at under £50 (also from Silica). ***MS***

SMALL CLUB ACCOUNTS

I am treasurer of a recently-formed camcorder user club, and I have a limited amount to spend on an accounts package. Do you know of any Public Domain program for small club accounts?
Ian White
Bath

I cannot bring one to mind. However, there are two things to consider here: most PD software is written in the US, so it will be tailored for their needs; and more importantly, it comes without warranty. In other words, if something goes wrong and you lose data or it gets its sums wrong, you have no comeback.

Commercial software must offer some sort of warranty (although the disclaimers often try to get around this), and you'll have someone on the other end of a telephone if you do get into difficulties, so I'll have to play it safe and recommend *Home Accounts 2* from Digita (☎ 0395 270273). At under £55 it should do everything you need and more. ***MS***

JARGON BUSTING

Cell – (Spreadsheet) The intersection of a row and column – a container for one item of data, calculation etc.

Field – (Database) The container for a single item of data.

File – A collection of items – records in a database or a complete worksheet for a spreadsheet.

Record – (Database) A collection of one or more separate fields.

MUSIC

Music

COMMON QUERIES

THE MIDI OPTION

I've been creating music on my Amiga for a while now, just using internal samples in *OctaMED*. I now want to expand my music set-up to start using MIDI. What would I need to start creating music using MIDI on a limited budget?

The first thing you'll need is a MIDI interface. There are a few available, but the favourite low-priced model is the Datel MIDI Master (for about £20). The next thing you'll need is a sound source – and this is where things start to get expensive. The cheapest module you can get is the Dream GMX-1. This MIDI module contains 128 sounds and a selection of drums and percussion effects – a good place to start.

To drive the sounds, you'll need a MIDI sequencing program, and this depends on the model of your Amiga and the version of *OctaMED* you are using. *OctaMED* can support MIDI, but it's quite rudimentary in places. *OctaMED Pro v5*, the latest version, has a much more impressive range of MIDI tools but only runs on Workbench 3 machines. Alternatively, you can pick up something like *Music-X* fairly cheap, since the new version is due later this year. ***ME***

- **MIDI Master, £19.99, Datel ☎ 0782 744707**
- **Dream GMX-1, £199, Arbiter ☎ 081 202 1199**
- **OctaMED Pro v5, £30, RBF Software, 169 Dale Valley Road, Southampton SO1 6QX**
- **Music-X, £199 (but shop around for cheaper deals), The Software Business ☎ 0480 496497**

UPGRADE ADVICE

For the past few years, I have been using *Music-X* to play music on my Korg M1. I have recently upgraded to an A1200 with a hard drive only to find that *Music-X* doesn't work on it. Can this be rectified?

It certainly can. The problem is that *Music-X* tries to grab all the Amiga's Chip RAM for samples – which means there's nowhere for the program to be loaded! All you need to do is click on *Music-X's* icon and select **Information** from the **Icons** menu. In the **Tool Types** text area type **BUFFER=600000.** This reserves about 600K, which should be ample memory for the program to use and still gives you heaps of sample space. ***ME***

READERS' QUESTIONS

JINGLING CHANGE

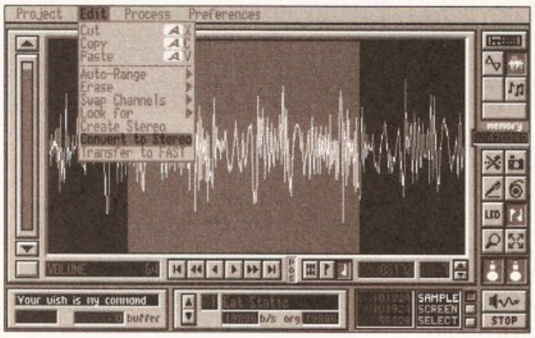
I am involved with the running of a hospital radio station. We are looking into methods of recording, storage and on-air reproduction of jingles. My idea is to use an A600 with a cheap sampler connected to our mixing desk and firing off previously stored jingles. Would we be able to sample and store jingles on disk for subsequent retrieval? Does the A600 have any technical limitations in sample length or sound quality? Are these affected by whether it is an FD or HD model?

Is there a public domain (or cheaply available) program you could recommend that would play back these samples off the disks or from memory at the touch of the button? Bear in mind that it must be very easy to use and hard to make mistakes with. Are there any programs which would enable us to edit sampled jingles to create new ones as well as doing the above?

Which low-price sampler would you recommend for the task?
Simon Clarke
Arrowe Sound Hospital Radio
Wirral

To begin with, considering the fact that you mainly want the machine for playing back samples, it may be worth shelling out a little bit extra and going for an A1200. The A1200 has 2Mb of Chip RAM as opposed to the A600's 1 meg. This is important when using samples, since a sample has to be stored in Chip RAM for the Amiga to play it.

As far as technical limitations go, the Amiga's sample playback capabilities shouldn't offer too many problems, but it's obviously not going to be of the same standard as a full-blown studio sampler. Sampling at a usable quality on an A1200 will give you about a minute's worth of playback – so the jingles would have to be fairly short. The only advantage of using a hard-disk system as opposed to a floppy drive is that you can store more samples on a hard disk and load them quickly.



GVP's DSS8+ software enables you to edit a sample in memory, as well as record it and store it on disk.

No matter what system you use for playing back the samples, you'll have to get hold of a sampling package to record them in the first place. This answers another one of your questions: you will be able to edit jingles on screen and store them as new samples (as long as they fit in memory).

There are a couple of packages at around the £40–£50 mark that enable you to store a number of samples in memory, such as New Dimensions' *Technosound Turbo 2* and GVP's *DSS8+*. Using these you can put a sample into a list and recall it using the mouse, playing it back from the keyboard when needed. If you want to play samples straight from disk, Sunrize's *Audition 4* offers you the ability to record samples straight to floppy and just boot up the disk to play it back. Unfortunately you won't be able to edit them afterwards, so choose the method you require carefully. ***ME***

- **Technosound Turbo 2, £49.99, New Dimensions ☎ 0291 690933**
- **DSS8+, £49, Silica Systems ☎ 081 309 1111**
- **Audition 4, £TBC, Meridian Software ☎ 081 543 3500**

UP THE GRADE

I am seriously considering upgrading to an A1200 or A4000/030, but not having a money tree growing in my garden I would like a few questions answered before I invest. I mainly use my machine for music and graphics, so my questions are:
1. Does *OctaMED* run better in eight-channel mode (without the loss of sample quality as on the A500) on the new Amigas thanks to the faster processors?
2. Would it be possible to use two Amigas (somehow synced together) until such time as Commodore give us more than four channels of 8-bit sound on 32-bit machines? If so, how could I best do this and what hardware (other than another Amiga) would be needed?
S J Smith
Colchester

1. Using *OctaMED* on a 32-bit machine won't improve the sample quality, because the sound chip is still only designed to play back four channels of sound, so you're bound to lose some quality.
2. Yes, you can use two Amigas to supply eight channels of sound. There are a couple of ways of doing this. The first is to set the second machine as a "slave" by setting the sync on the second machine to external MIDI. Now you can drive the second machine in time with the first. Using a similar process, you could assign four MIDI channel outputs on the first machine in addition to the four internal tracks, and trigger the sounds on the second machine via MIDI. The only extra gear you need to do this is two MIDI interfaces (one for each Amiga) and a MIDI lead. Unfortunately, this is only possible with later versions of *OctaMED* and *OctaMED Pro*, so if you've got an early version, chances are you won't be able to do it.

The second method is the process used by dance group Urban Shakedown. What you do is put four bars containing a simple metronome click at the beginning of the track, followed by an empty bar before the music starts. Do the same for the second Amiga, except put one less bar of clicks. Now start the first Amiga, then start the second one in time with the click. Adjust the timing slightly so that the two machines are in time and then start recording. With a bit of practice you can get very acceptable results. ***ME***

JARGON BUSTING

MIDI – Musical Instrument Digital Interface. A system that enables MIDI-compatible instruments and computers to communicate with each other, so that you can control your MIDI keyboard, for example, from a sequencer program running on your Amiga.

Sample – A "grab" of music or sound converted to digital form by a device called a sampler. This means that the sound can be edited in various ways using a computer program or stored on disk for later use.

PRINTERS

Printing

COMMON QUERIES

WHITE ELEPHANT

Could you tell me the dip switch settings and the correct printer driver to use with the Archibald X99T printer that I bought for 3p and an old lolly stick at a car boot sale? I do not have a manual.

If I don't happen to know that "Archibald" products are marketed in the UK by Leach of Bristol, all I can do is try to find out the phone number for Archibald. How do I do that? I phone directory enquiries and ask. If they've got no listing for a firm called "Archibald", then that's the end of that. You can do this yourself, can't you? ***JW***

AAARRGGH!

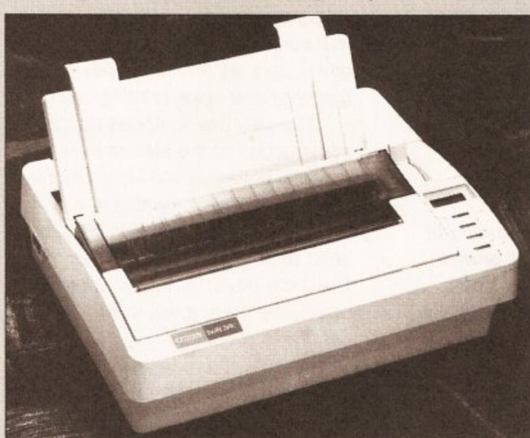
Where can I find a correct printer driver for...?

If it's a Star printer, phone Star; they have some Amiga drivers. If it is a Panasonic printer, phone Panasonic; they have some Amiga drivers. If it's a Citizen printer, get *Citizen Print Manager*. If Star or Panasonic don't have an Amiga driver for your model of printer, or if *Citizen Print Manager* doesn't support your Citizen printer, try **EpsonQ** if it is a 24-pin printer, **EpsonX** or **EpsonXOld** if it is a 9-pin. If these don't work, call around the PD libraries. That's all you can do.

If it's a Canon printer, phone Canon; they have Amiga drivers for all the "BJ" bubble jets and some of their laser printers. If Canon don't have an Amiga driver for a Canon printer, no-one will.

If it is a Hewlett-Packard printer, get the *Studio Printer Software* (£49.95 from JAM ☎ 0895 274449), which includes full Workbench and enhanced printing support for the full range of Hewlett-Packard DeskJets and LaserJets. *Studio* also supports all the Epson-compatible 24/48/64-pin/jet printers made by all the above-mentioned manufacturers, and many more.

If it is an old printer, try **MPS-1000, EpsonX, EpsonXOld** and **EpsonQ**. If none of these work, use the **Generic** driver. This will at least enable you to print plain text, but no styles (like italics) or graphics. If **Generic** doesn't work, you've got a really weird printer. Consider replacing it with a printer that is supported by the Amiga. ***JW***



If you're having problems printing on a Citizen Swift 240C or similar, try Citizen's Print Manager software.

DRAWING A BLANK

I keep getting blank pages fed through the printer between pages of a continuous printout. How do I stop this from happening?

It is most likely that your Workbench printer preferences and the page size in your software are set up incorrectly. Read the article in *Amiga Shopper* 29 about describing page sizes correctly. If you missed that issue, turn to page 116. ***JW***

IN THE DARK

I have a 24-pin mono printer. I'm using my word processor to print

continued on page 48

READERS' QUESTIONS

DESKJET CUT-OFF

When using *PageSetter 3* with my DeskJet 500C, I cannot print below a line that is 1.7in above the bottom of an A4 page. I have tried to change every possible switch in Preferences, and changed the page size to make the length 1.7in longer. Whatever I do seems to make no difference.

I would point out that I can print from top to bottom of an A4 page when I use *Protext* and its own printer driver. This says to me that the problem has to be the printer driver, which was supplied to me with the printer.

Geoffrey M J Culbertson
Horndean
Hampshire

In the Workbench 1.3 **Change Printer** panel, in the **Paper Size** section, select the **Custom** and **Fanfold** options and set your **Length** to 68 lines. Now try to print a full A4-length page and see what happens. If it doesn't work it means there is a maximum length for printing graphics hard-coded into the printer driver. This doesn't affect *Protext* because, apart from the fact that it uses its own drivers, it is printing text not graphics. DTP programs print everything as graphics; even the text is graphics.

If you phone Hewlett-Packard about this problem they will suggest you contact *Just Amiga Monthly* (0895 274449) and ask about the *Studio Printer Software* for the Amiga, which contains full Workbench and enhanced support for the complete Hewlett-Packard range of DeskJets and LaserJets. But since this software requires Workbench 2 or better, you'll have to upgrade your Amiga first. ***JW***

NO ROOM FOR THE PM

Please help me make room on my Workbench 3 disk so I can install *Citizen Print Manager* to use with my Swift 9. It needs 240K, and the best I can do is 130K by binning the Utilities drawer.

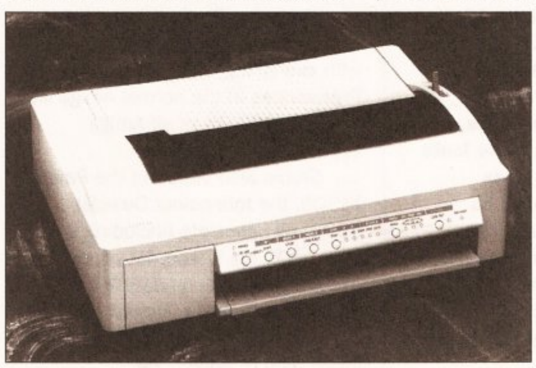
Clive Cook
London W7

The *PMInstall* program installs a number of files you don't require – all the printer drivers that are not for the Swift 9, and the language files that are not English.

The thing to do is use *PMInstall* to first install the program to the RAM disk. So specify **RAM:** when it asks where to install it to. When it's finished installing, follow these steps:

- Open the RAM disk icon.
- Open the **CITIZENPM** drawer that's in the RAM disk.
- Select **Show/All Files** from the Workbench Window menu.
- Open the **PM** drawer that appears.
- Delete all the files in the **PM** drawer except for those named **tco, tde, tt0** and **tt1.**
- Close the **PM** drawer.
- Open the **Printers** drawer.
- Delete all the files in the **Printers** drawer except for the **Swift9.m** file.
- Close the **Printers** drawer.
- Close the **CITIZENPM** drawer.
- Drag the **CITIZENPM** drawer on to your Workbench 3.0 disk, the one from which you have already deleted the **Utilities** drawer.

I think you'll find it fits – just! ***JW***



Hewlett-Packard call their inkjet printers "DeskJets". Canon call theirs "bubble jets", like this BJ-300.

HOW DO I GET AT MY FONT CATRIDGES?

I've had an Olivetti DM124C printer for almost two years, which was quite good as printers go, using it in Epson LQ2550 emulation. The only driver I could get was EpsonQ, which didn't give the best printer output.

I wanted something better for graphics and had on my shopping list the Canon BJC-800, PaintJet XL300 and DeskJet 500C. Trying to get literature and information was a nightmare! Canon were quite good, but Hewlett-Packard could have been more helpful. The biggest problem was finding out what printer drivers were available for the Amiga 500. Since then, of course, Canon have done a good job on drivers – I wish I'd known then what I know now – but Hewlett-Packard just don't want to know us Amiga owners. Or so it seems.

Anyway, I finished up with a Deskjet 500C, bought a Jamdisk with a driver on (which isn't perfect), and also bought Pacific Data Products' 25-in-1 fonts cartridges. With both the printer and the font cartridges I received a bundle of disks and instructions for MS-DOS and Windoze. Both companies must think the whole world revolves around PCs.

Not being too impressed with the DeskJet 500C driver on the Jamdisk, I bought *TurboPrint*

continued from page 47

documents that contain both text and greyscale graphics, but while the quality of the text is excellent, the graphics are very dark. How can I improve the printed appearance of the graphics?

The reason the graphics are dark is that the individual dots printed by the printer are too close together. There is little white space between them, so everything appears very dark. To brighten the output you have to cause the dots to be printed further apart, thereby introducing some white between the dots. The easiest way to do this is to print at a lower resolution, or "density" as much software calls it. Assuming you are using the correct driver, density 7 is 360dpi for 24-pin printers; try density 4, which should be 180 dpi. Alas, while enhancing the appearance of the graphics, this will degrade the quality of the text.

The closeness of the dots in the graphics is dictated by the dither pattern used to print the greys. Workbench only has three dithers to choose from, and they are all "tight" patterns. Print enhancing software like *Studio* or *Turboprint* will enable you to use a different dither pattern – one in which the individual dots are not printed so close together – and this will enable you to print at the highest resolution so that the text is printed well, while the enhanced dither pattern used for the graphics will ensure that they appear less muddy.

There's a limit to what can be done to enhance 24-pin output because the individual dots are (in printer terms) very large. To get higher quality graphics you need a printer that prints smaller dots, which means an ink-jet, a bubble jet or a laser printer. ***JW***

PRINTER GO-SLOW

I'm very happy with the quality of printouts from my ink-jet printer, but they take a very long time indeed to print. Sometimes I have to wait half-an-hour or longer for a full page of text and graphics. Is there any way to significantly speed up printing? I've tried the trick with CMD, but it really doesn't help that much – a few minutes, that's all.

Alas, no. Well, no inexpensive way at least. The main thing that is taking up the time is not the printing by the printer, nor the transfer of data from the Amiga to the printer. That's why the trick with CMD only helps a little. (For what this involves, see page 33.) What's taking the time is the construction in memory of the page (or strips of the page) at printer output resolution. The higher the resolution, the bigger the picture that has to be constructed, the longer this takes. For printing in colour the Amiga has to construct four versions of the picture (or strip of it) – one each for the cyan, yellow, magenta and black printing colours.

The only way to speed up the construction of the picture in memory is to give the Amiga more processing power – which is a euphemistic way of saying that you need to buy an accelerator board. The more powerful the accelerator board, the more it will speed up the printing of graphics.

Actually, there is one other way to speed up printing, and that is for the software that's doing the printing to "cut corners" by not printing all the colour information. One or two Amiga programs do this, and users of such software often boast about the speed of their printouts. That's all fine and dandy, but what's the use in having a wonderful and expensive colour printer when your software is deliberately printing in fewer shades than it should be? ***JW***

WHERE'S ME FONTS?

My printer has eight fonts in it, and I want to be able to use them all in my documents, but my word processor can only use one of them. I can change fonts only by selecting others via the printer's control panel, but how can I do it from the word processor? Do I need a special printer driver? I don't have any problem doing this on my PC at work.

On the Amiga, printer fonts have to be specifically supported by the third-party software because they are not supported at the operating system level. Printer drivers for the Windows operating system on the PC have built-in support for printer fonts and some of them are more than a megabyte big. *Protext* is probably the best choice on the Amiga, but this is not a WYSIWYG word processor. If you want WYSIWYG and (partial) printer font support your only choice is *Wordworth 2*. ***JW***

***Professional 2.* The result? Fantastic graphics! But nobody told me that you can't access either Hewlett-Packard or PDP fonts cartridges, though both the internal HP fonts and the PDP fonts will come out on test.**

To cut a long story short, *Turboprint* can access them, in a manner of speaking. This letter is being written with *ProWrite* 2.0 using Topaz 11pt on-screen. If I put it straight to print on the DeskJet 500C it will print in Courier 12pt, the default printer font. But if I select a font by its ID number (in the *Turboprint* menu) I can get Times Roman in any point size, or Helvetica, even though these fonts are not in the *ProWrite* fonts directory. So they can only be coming from the font cartridges.

I've tried all 19 ID numbers in all point sizes, and come up with some interesting results. But still no Topaz 11pt. Can anybody take it any further?
Alan Heward
Wallsend
N Tyneside

The solution is *Studio*, available from JAM on 0895 274449. The package includes a proper, 100%-Amiga-compatible DeskJet 500C printer driver (a normal Preferences driver in other words), only much enhanced. A special preferences program enables you to select and use any font from any cartridge (including PDP). It even contains a database of the latest typeface base values, enabling you to calculate a type family. Page size restrictions are also now a thing of the past.

Graphics-wise, the *Studio* drivers print to 24-bit colour accuracy and 8-bit greyscale accuracy – that's 16.7 million colours and 256 greys instead of the Amiga's (and *TurboPrint's)* limitation of 4,096 colours and 16 greys. Many different dithering methods are selectable.

Since the *Studio* drivers are 100% Amiga compatible, they work with everything that prints via Preferences in the normal Amiga way – which is 99.9% of all Amiga applications software.

Studio also supports the PaintJet XL300, the four-colour DeskJet 550C, all LaserJets (including the latest 600 dpi IV and 4M models), and most Epson compatible 24-pin and 48-pin printers, including a special mode for the Star SJ-48 inkjet. End of advert. ***JW***

DEEPLY DIPPY

Recently I upgraded my printer so that I could print DTP work from *PageSetter 3.* While the printer works well with this and my other graphics programs *(Deluxe Paint* for example) I am having problems printing text from *Excellence 3* in both Draft and NLQ modes. The line spacing is too much – it looks almost double-spaced, which I don't want. If I change the line spacing to 9 or lower then the spacing gets so small that the descenders on some letters interfere with the letters on the line below it.

I have tried every type of printer driver including BJ10e, BJ130e, EpsonQ, NEC_Pinwriter, plus EpsonX and EpsonXOld even though I know they are not compatible. I have also tried most of the dip switch settings.

I know that this spacing is not the printer's fault because I can print documents with the correct line spacing on my Amstrad NC100 Notepad using an EpsonQ driver.
N Mason
Woodthorpe
Nottingham

The printouts you sent me showed that the *Excellence* output was not double-spaced. For every four lines printed by the Notepad, *Excellence* is printing three lines, so it can't be a wrong dip switch setting – this would cause double spacing.

I tried to reproduce your problem with my Canon BJ-230, but couldn't. Using Topaz/8 and line spacing set to 9, and Topaz/11 with line spacing set to 12, I got perfect printouts from *Excellence* at 6 lines per inch, just like you do with your Notepad. So I can only assume it is a printer driver problem. Call Canon Technical Support on 081 647 4044 and ask for the free Canon Drivers disk. When I reviewed the BJ-10sx for *Amiga Shopper* 29 I used the driver named "CanonBJ5-230" from this disk and it worked fine. ***JW***

JARGON BUSTING

Dither pattern – The pattern of dots that is used to simulate different shades of grey on a monochrome printer or to mix colours on a colour printer.

Dip switch – One of a set of little switches inside your printer that set certain functions like emulation, paper length, language, character set and so on. Dip switch settings usually take precedence over software commands from your printer driver, so it is important to get them right.

Printer driver – A translator – actually a small self-contained program, independent of your DTP or WP package – that enables the Amiga to communicate with a particular model of printer. Different printers require information in different formats.

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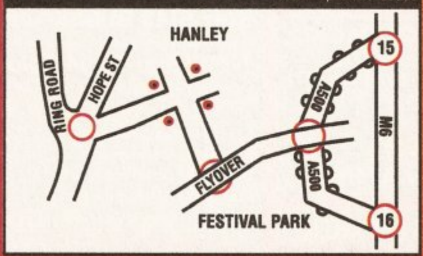
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DTP and WP

DTP

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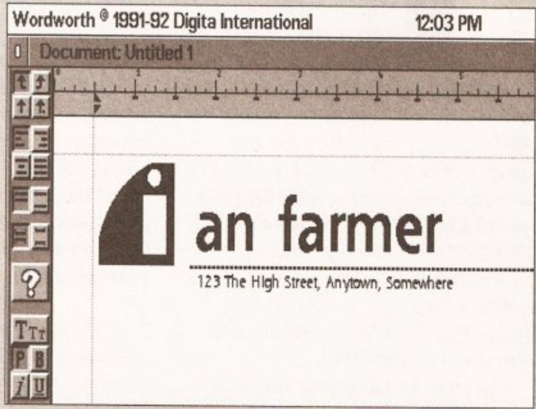
BLOCKY GRAPHICS

I have designed a distinctive personal logo in *DPaint* for use in *Wordworth 2*. It's only black and white. But when I printed my first letter (I have a bubble jet) it looked awful; it was all blocky and had jaggy curves and diagonals. So I tried the trick of designing it very large in *DPaint*, and then scaling it smaller after importing into *Wordworth 2*. What I got this time was even worse. How can I get *Wordworth* to print my logo so that it looks professional rather than something out of the Stone Age?

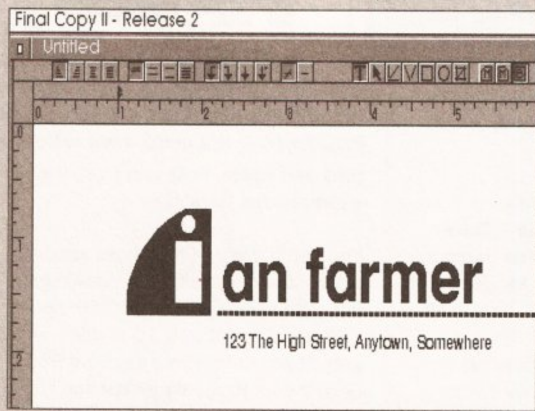
You can't – not with *Wordworth* at least. When you re-size a graphic in *Wordworth* the software scales exactly what it has on the screen, and then replaces the previous-sized graphic with the new size. *Wordworth* prints graphics exactly as they are on the screen rather than printing a scaled-down version of the original-sized graphic.

You will have to use another word processor – *Final Copy II* does what you want – or any desktop publishing program.

Alternatively, print your logo from *DPaint* using a **%Wide** figure of 21% to get the best possible resolution for your bubble jet, and then cut this out, paste it on to another sheet of paper in the correct position, then get some photocopies of it made. This way you won't have to worry about printing your logo every time you print a letter. ***JW***



Wordworth and Final Copy II can both import ILBM graphics, but while Wordworth not only displays...



... but prints jagged curves of scaled-down graphics, Final Copy II's output is much more smooth.

MISSING CHARACTERS

When I select large point sizes in *PageSetter 3*, only some characters print properly, while the rest get printed as boxes with small letters in the bottom left-hand corners of them. What am I doing wrong?

Nothing. It's a memory problem. The larger the point size, the more memory is needed to display a Compugraphic character on the screen, which has a resolution of about 70 to 75 dots per inch. Your 24-pin printer has a much higher resolution of 360 dots per inch, so even more memory is required to construct that character.

continued on page 54

READERS' QUESTIONS

MAKING A START

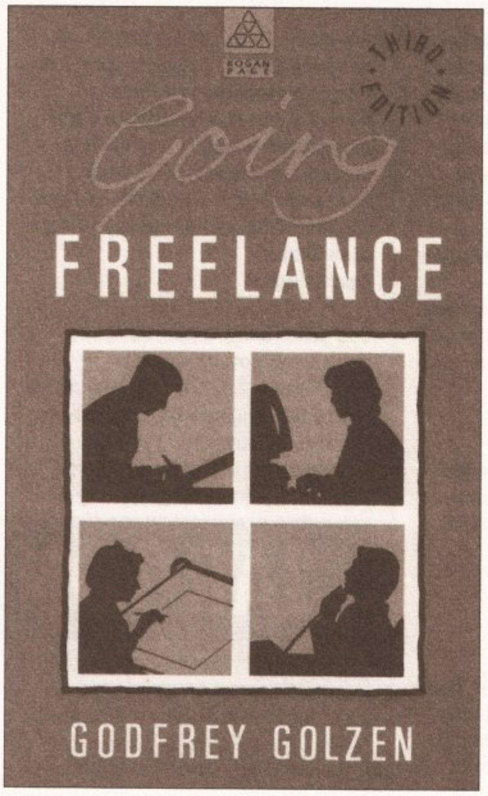
After reading your article on making money with an Amiga [*Amiga Shopper* 28 – order a copy on page 116 if you missed it] **I am seriously considering setting up my own DTP service. At present I have a standard Amiga 500 Plus. Would it be better to upgrade to a more powerful computer or to expand my 500 Plus?**

I will need a capable printer, hard drive, extra memory and software, but after looking through back issues of *Amiga Shopper* I find it very difficult to choose between the many products available. I have around £1,500 to spend.

I also need advice on the business side of setting up such a service. Are there any good books you could recommend?

Andrew Hughes
Porthill
Staffordshire

You are wise not to rush out and blow that £1,500 willy-nilly because it is barely enough to get you going. I'd be tempted to try to raise another £1,500. I know that's easy to say, but if your business goes off half-cocked (sorry, "under-capitalised" is the posh term) you may find that it'll all be over before it starts. Having said that, one good idea can often make up for a lack of capital.



Thinking of striking out alone? This inexpensive book contains a wealth of valuable advice.

Let's begin with the printer. This will be used for you to "proof" your work and to show your clients a rough idea of what they will be getting. It will not be used to produce finished artwork – you (or your client) will get that printed at a DTP bureau or High Street copyshop. If you intend to desktop publish in colour, then a colour printer will be needed. A colour dot-matrix or "pin" printer will not be good enough – if you decide "it will do" you may very soon regret wasting that money. At the very least you need an inkjet printer, and that means something like a Hewlett-Packard DeskJet 550C. There's £600 to £700 spent straight away. Cheaper high-quality colour printers are just around the corner, so perhaps it would be best to keep a watching brief for a while.

You do need a more expandable computer. The sensible decision would be an Amiga 4000/030, which comes with memory and a hard drive. If you buy a bigger hard drive and more memory at the same time, I think you'll find that many dealers will be prepared to "do a deal". But the least you'll have to spend on this is about £1,000.

If you buy an A1200 (£299) you'll have to spend about £200 to £300 more on a large enough hard drive and another £300–£400 on some trap-door 32-bit memory. That comes to £800–£1,000. So about the same money for a slower and less expandable computer.

After buying the computer, you will have less than £500 left, which will not be enough for a decent colour printer, and only barely enough for a decent high-quality monochrome printer like the Hewlett-Packard DeskJet 510 or Canon BJ-200. Keep in mind that if you show clients poor quality proofs they will worry about how good the final artwork will be. It's not good to worry clients – worried clients tend to say "Are you sure it'll be okay?" a lot.

Software-wise you'll need *Professional Page* or *PageStream*. There's no point in going into which is the best, both have their good and bad points. Read the reviews and make your decision. (*ProPage 4* was reviewed in *Amiga Shopper* 27, *PageStream* in *AS* 17. Both issues are still available – see page 116.) If you buy *PageStream 2.2* now you will be eligible for a free upgrade to *PageStream 3* when it is released.

You will also need illustration software. Buy *Art Expression* if you buy *PageStream;* buy *Professional Draw* if you buy *Professional Page*. You might also need a mono hand scanner for grabbing line art (text, logos, cartoons and the like) into the

continued from page 53

When memory is tight, *PageSetter 3* displays and prints these empty boxes; the alternative is to print nothing, which would be even worse.

The solution is to buy more memory. Another 4Mb of extra memory will do; anything less than this is not comfortable. ***JW***

WRONG SIZE

I'm using *Final Copy II* to produce A3 flyers, which I am printing with my Canon BJ-230 A3 printer. The trouble is, the printer keeps feeding the paper out after about 12in. Do I have my page set-up wrong, or what?

It's your Workbench **Printer** preferences. Select **Wide Tractor Paper Format, Continuous Paper Type** and enter a **Paper Length** of **100 lines** (assuming you have **6 lpi Print Spacing** selected). Then make sure you select the **Continuous** option from the *Final Copy II* print requester. ***JW***

MISSING FILLS

I have created an object in *ProDraw* that has a gradient fill from 7% Grey to White in eight steps. But when I print this object on my SJ-48 printer I get only three shades – grey, light grey and white. How can I get the eight shades to print?

You can't. Without help from special print-enhancing software, the Amiga (via Workbench printer preferences, that is) can print only 16 shades of grey. If you create your gradient from (say) a pink to a pale yellow and then print in colour mode you might get a better looking fill. ***JW***



If you are having any problems at all with PageSetter II, by far the best thing you can do is upgrade to PageSetter3. It's much more refined all round.

GIVE ME ASSIGN

I have installed *PageSetter 2* on to my hard drive following the manual exactly, including altering the startup-sequence, but it keeps asking me to insert the CGFonts disk despite the fact that I have used the required Assign command.

If you are getting a requester that says "Please insert volume **CGFonts** in any drive" it means that you have not assigned the **CGFONTS:** logical device. Check your startup-sequence again, and make sure the relevant Assign command has been typed correctly. The syntax is **ASSIGN [one space] CGFONTS: [one space] DEVICE:PATH [carriage return]** – the words between square brackets being the keys you should press. Ensure that there is a colon directly after the S in **CGFONTS.**

So an example assign might be:

```
ASSIGN CGFONTS: DH1:PAGE ☛
SETTER2/CGFONTS
```

I recommend that you upgrade to *PageSetter3* – it is a much more stable version of the program that handles Compugraphic fonts more quickly and efficiently. JW

FONT CONVERSION

Is there a way to convert the Intellifonts that come with *Wordworth 2* so that they can be used with *ProPage* and *ProDraw?*

Yes. Soft-Logik's *TypeSmith* program will import the *Wordworth* **".type"** files and can export them in the format used by Gold Disk software, along with the necessary **".metric"** and **".dat"** files. ***JW***

HOTLINKING

I've got *ProPage 4* and *ProDraw 3* loaded. I want to quickly create an object in *ProDraw* and suck it into a box in *ProPage.* Is there any way of doing this via the hotlink rather than having to save it as a clip from *ProDraw* and then import it into *ProPage* in the normal way?

Yes, I suppose it's not immediately obvious how do this, but you'll be slapping your forehead in a second. Drag out a bounding box in *ProPage* and send that (even though it is empty) to *ProDraw* via the hotlink. A requester will pop up on the *ProDraw* screen complaining that *ProPage* wants an object. So create or group your object in *ProDraw,* and send it back to *ProPage* via the hotlink. ***JW***

computer. If you need to scan photographs, don't waste your money on a mono hand scanner, you need a colour one.

I don't know of any books about setting up small design businesses, only large ones. They won't be any help to you. But you might like to try *Going Freelance* (Third Edition) by Godfrey Golzen (ISBN 0-7494-0405-1). Published by Kogan Page, it costs £8.99 and contains much good advice about working for yourself, including a section on starting a design-related business. The business advice in *AS* 28 will also point you in the right direction. ***JW***

USE YOUR HEAD

I want to make a letterhead in *PageStream* and then get *Protext* to print this out at the head of my letters. I have made the letterhead, saved it to disk, and can import it to *Protext* using ">IB DH1:PageStream/letterhead" and it prints with no trouble. The problem is that after the letterhead is printed, the page is ejected. How can I get *Protext* to print the letterhead and the letter together?
J H M Joel
Capdepera
Mallorca

Create the letterhead in *PageStream* and when you've finished it reduce the length of the page **(Layout/Set Page Dimensions)** so that it is the same height as the letterhead logo. Print the page to disk, but first checkmark the **Manual Feed** option in the **Print Document** requester.

Now do what you normally do in *Protext* with the **>IB** command. Works fine, except it takes absolutely ages to print the *PageStream* letterhead file. Wouldn't it be simpler to print out a lot of blank letterheads from *PageStream* and use them "pre-printed" with *Protext?* ***JW***

NO FRILLS, THANKS

I am not interested in all the frills that come with word processors these days – graphics, fancy fonts and layout, etc etc. Can you recommend a good basic WP?
Albert Finnegan
Dublin

There are few WPs with no frills at all – but presumably you do want more than just a basic text editor like *Ed.* You might try *TransWrite* (£39.95 Silica Systems ☎ 081 309 1111), but it wouldn't hurt to check our round-up of WPs in *AS* 25 and make an informed decision.

INVISIBLE TEXT

I have *PageStream 2.1.* The problem is that it seems hit or miss whether text appears on-screen at all when I am typing it in. Then if I try to do anything to this "invisible text", the program crashes – for instance, when I try to stretch the text and most times when I zoom in. This happens whether I run the program from copies of the originals or from the hard disk. What's going wrong?
Alan Foster
Southampton

The same thing happened to me when I first got my hands on *PageStream 2.1,* and it took a phone call to Soft-Logik to find the answer.

The difficulty is in the Font Manager part of the program. You simply need to tell *PageStream* where your fonts are. So select **Fonts/Points** from the **Style** menu and click on the **Manager** button in the requester that appears.

One at a time, click on each font in the drawer and then **Update** – so, for instance, click on **PSFonts/CSTriumvirate** then on **Update,** click on **PSFonts/CSTimes** then on **Update,** and so on until you've updated the whole list.

Don't click on **Exit** when you're finished, though: click on **Default,** and then **OK** from the **Fonts/Points** requester – this ensures that *PageStream* remembers where all the fonts are the next time you load the program. ***JW***

JARGON BUSTING

Bitmap – A graphic made up of "pixels" or picture elements, produced with a painting program like *Deluxe Paint,* for example, or from a scanner or video digitiser.

Illustration – A structured drawing produced with software like *Art Expression* or *ProDraw.*

Monochrome – Literally one (mono) colour (chrome). Monochrome scanners can produce only black dots, but these can be arranged in differing patterns to simulate shades of grey.

Proofs – Rough printouts of the finished design that enable you to correct mistakes before preparing the final artwork (finals).

Scanner – A device used to convert images, artwork and text on paper into a form that can be used by computer software.

Video & Graphics

VIDEO

COMMON QUERIES

TITLING NEEDS

What do I need to be able to overlay titles and animations on my videos using my Amiga?

You'll need several things. First you'll require a genlock, which is the machine that actually does the superimposing. Then you need both a video source and a video recorder – presuming you want to save your work. The camcorder that you shot the footage on should do fine, as would most video sources. Make sure you get a genlock which is compatible with your video equipment – for instance YC if you have S-VHS or Video8, composite if you have VHS. And of course you'll need some suitable software – I'd recommend *Deluxe Paint IV* (£90 from Electronic Arts ☎ 0753 549442) and *Big Alternative Scroller* (£40 from Alternative Image ☎ 0533 440041) for starters. ***GW***



The new Hama 292 Genlock (£299.99) can handle Hi-band or composite signals. Hama ☎ 0256 708110.

TOP VIDEO FORMATS

What's the best video format for recording Amiga graphics onto?

This will depend to a large extent on what quality you *really* need, because quality inevitably costs money. There's little point in recording at broadcast quality if the graphics will ultimately end up as part of a VHS copy of a wedding video, for instance.

So the prime concern is budget, which will probably determine *your* best video format for recording Amiga graphics onto. And don't forget that you'll also need to take into account a compatible genlock or video encoder – it's no use having expensive video kit if you plan on using a cheap genlock. ***GW***

AGA OR 24-BIT?

I want to produce top-quality graphics for video use but I'm not sure whether I should go for HAM-8 or for the full-blown 24-bit solution. What do you think?

Personally I'd recommend the 24-bit route, because you really do get *true* colour that way. HAM-8 is extremely good, but it still doesn't quite measure up to the quality provided by 24-bit cards.

If it's a choice based upon financial considerations then you may well be tempted to buy an Amiga 4000 and live with HAM-8, but if you look around you can find great prices on high-spec Amiga 3000s (which have suitable expansion slots, unlike the A1200), and still afford to add a 24-bit card and genlock for less than the cost of a new A4000/040. The A3000 also has a built-in SCSI controller (so you can easily add multiple SCSI devices such as a hard drive, scanner or tape streamer, should you need to). Of course you won't get AGA graphics or Workbench 3, but then you won't really need them if you have a 24-bit card. ***GW***

FUNNY COLOURS

I've made some animations using both *VistaPro 3.0* and *Imagine 2* which I've rendered in lo-res, 32 colours, but when I play them back with *Deluxe Paint III* the colours keep flashing and only the last frame looks like it should. Where am I going wrong?

You're not really going wrong anywhere, it's *Deluxe Paint III* which

continued on page 56

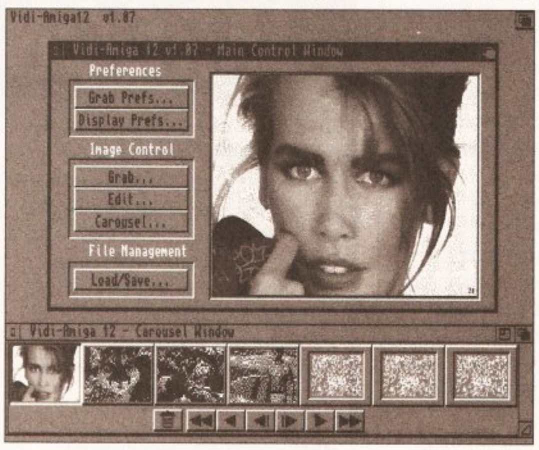
READERS' QUESTIONS

A1200 TROUBLES

I recently bought an Amiga 1200 and I've had a few problems which I would be grateful for your advice on.
1. My RocGen Plus genlock will not go into high-res/interlaced mode when the display is changed. The unit is two years old and has a power supply fitted. Is there a problem with this and the 1200?
2. I tested the 1200 modulator, which is okay, but the sound is distorted (buzzing sound from TV speaker) when the hard drive is not being used but clears when it *is* being used. Is this a fault?
3. My monitor is a Philips CM8833 and it worked okay with my A500 Plus but now that it's connected to my A1200 the display is dark and I have to turn the contrast and brightness right up to see the Workbench screen. Why?
4. Lastly, I have a Vidi-Amiga 12 with version 3 AGA software. The problem is that when I pause my video (which has a 4-head still-frame facility) the display on my composite monitor stays completely still but the picture on the Vidi-Amiga screen keeps moving up and down. When I grab the frame and mix it the outcome is a mess because the red, green and blue parts don't seem to be overlaid properly. How can I stop this?
Phil Higgins,
Manchester

1. It is known that there are problems with older RocGens when used with the A1200. RocTec have now fixed these incompatibilities in their latest releases but obviously the older models will continue to be "faulty". I suggest you contact your supplier, or a RocTec dealer, for further advice.
2. Sure sounds like a fault to me.
3. Again, this doesn't sound right. I should contact your dealer and tell them you want something done about it pronto. For the time being you could try using **Prefs/Palette** to change your Workbench colours.
4. This one's a bit more tricky. The problem is probably caused by "interlace jitter", which happens even with the best digitisers. This phenomenon occurs as a result of the two fields which make up a single video frame being markedly different and when the digitiser attempts to resolve the image the result is that some (or occasionally all) of the image flickers violently.

More sophisticated software is able to deal with this problem by performing a process called "deinterlacing", though as far as I know the Vidi-Amiga software does not do this, so the only immediate solution is to try to find a nearby frame where jitter is not present. Typically this problem occurs in frames depicting fast-moving action, such as sports or high-speed chases, but anything with rapid movement can be affected. ***GW***



I've always wondered: does Rombo's Vidi-Amiga 12 come supplied with a pin-up of Jamie Lee Curtis?

RECORDING IN RGB

Can the Amiga's RGB output be recorded to the SCART input of a video recorder? If it is possible I'm sure many readers would like to obtain the higher quality produced by this method, rather than by composite video. How about a pin-pin diagram?
John Harris
Peterlee
Co. Durham

No, I'm afraid it can't yet be done, unless of course it is a very well-kept secret! If it *were* possible we'd be doing it already, wouldn't we? ***GW***

WHICH MONITOR?

I sacrificed a monitor for a hard drive but now that I've got a bit more cash I'd like to buy a monitor again. However, I'm not sure what kind to get because there are so many different types available. I've seen my mate's 1084, which looks good, but if I finally upgrade to an A1200 or A4000/030 would I benefit from having a multisync? Also, why are multisync monitors more expensive?

If I do upgrade, will I be able to use my GVP Series II hard drive if I

continued from page 55

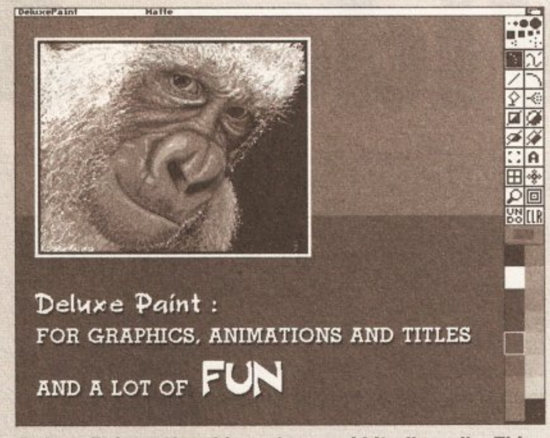
can't properly handle animations which have a different colour palette for each frame (such as *Vista* and *Imagine* produce). In the case of *Vista* the answer is simple: make sure that the **LockP** button is activated so that all of the frames use the same colour palette for rendering.

The solution is more difficult for *Imagine*, because you've probably already realised that its palette locking requester appears to make no difference at all to the outcome. Instead, render each frame separately rather than as an animation, and then use a program such as *Rend24* (which is shareware), *Art Department Professional* or *ImageFX* to compile your animation, ensuring that you lock the palette before starting. This should sort your problem out. ***GW***

LACK OF MEMORY (1)

I want to make some large animations with *Deluxe Paint* but I keep running out of memory, especially when picking up brushes. How much memory do I really need to be able to do what I want?

That's like asking how long a piece of string is! Gauging absolute memory requirements is almost impossible because there's really no way of knowing in advance exactly how much memory any given animation will consume. The best solution is to simply add as much memory as you can afford, and then some more. Apart from disk drives, memory is *the* most important extra for *any* serious Amiga application, and the more the merrier.



***Deluxe Paint* – the chimp above said it all, really. This mainstay of Amiga graphics is now up to version 4.**

Also, seriously consider upgrading your Amiga's Chip RAM, especially if you have an older A500. I'd also recommend adding DKB's excellent MegAChip card, even if it is more expensive than the competition. But remember that more Chip RAM is only really useful when extra Fast RAM has also been added, otherwise the Chip RAM will be used by software instead of Fast RAM and you'll not gain the full benefits of the extra graphics speed and flexibility that extra Chip RAM can provide. ***GW***

get some kind of adaptor?
Yorkie,
BFPO 20

Yes, you will benefit from buying a multisync if you upgrade your Amiga because you'll be able to use the new screen resolutions for flicker-free displays. Multisyncs cost more because they contain more complex circuitry, are better quality and have more features than a standard 1084-type monitor does. I suppose a good analogy is the price difference between a Ford Fiesta and a Ferrari. Both get you there, it's the quality of the ride that's different.



Commodore's new high-spec 1942 monitor. But is it named after the year of Pearl Harbor or that naff film?

As to how much more expensive, it all depends on how much you want to pay. It is possible to spend thousands if you want a large screen, top-of-the-range multisync, but Commodore's new 1942 monitor (which should be ideal for your needs) comes in at around £350.

Sadly, you won't be able to transfer your hard drive across to your new machine, unless you can find a SCSI card for the new Amiga and are prepared to do some hacking about. Your best bet would be to sell it and buy a new HD (if you get an A1200). The 4000/030 has a hard drive supplied. ***GW***

LACK OF MEMORY (2)

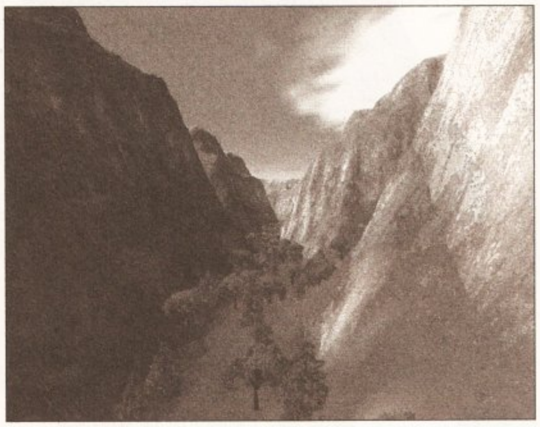
I've generated 182 frames with *Vista Pro 2* of the Grand Canyon and have stored them on ten disks (pic00000 – pic00181) but when I load them into RAM (I have 10Mb), run *Deluxe Paint IV* and then try to load all the images into it to make an animation I run out of memory. Can you help?
G. Mathieson,
Bangor

The obvious trouble here is that there isn't enough RAM to contain all the images, load *DPaint* and also store the animation which *DPaint* is attempting to build.

There are several solutions. The most tedious is to keep deleting the original frames by hand from RAM (after they have been incorporated into the new anim) by using the Shell or a disk-management program like *Directory Opus*.

A simpler but even more boring method would be to not use the RAM at all, but set up a 182-frame animation in *DPaint IV* and then load the frames one by one from disk, moving along a frame each time.

A better method would be to load all the frames from one disk, save the resulting animation to RAM disk (say as ANIM1), load all the frames from the second disk (save as ANIM2) and so on, then load the first animation, append the second, third and so on until you are done. For this to be successful you must have had the palette locked when you generated the original images.



The Grand Canyon, yesterday. Or possibly half a million years ago. It's kind of hard to tell the difference.

However, a much better alternative would be to get hold of a PD program called *Rend24*, which can be used to construct animations and can also delete frames after they have been used, thus freeing up memory as you go along. The animations it makes are compatible with *DPaint*, though it also has its own anim-player built in. You could even use *Rend24* to rescale your images and lock their palettes before adding the frames to the animation. Mind you, when I was testing *Rend24* (v1.05) with 320 x

JARGON BUSTING

Genlock – A device for getting two (or more) video sources to run in perfect synchronisation, in essence by "slaving" one (say, your Amiga) to the other (say, a video recorder). This enables clean vision mixing, including the overlaying of Amiga-generated images on to the video signal as well as stable wipes, fades and dissolves between the two sources.

HAM – Hold And Modify is an Amiga graphic mode allowing all 4,096 colours in the Amiga palette to be displayed at once on an appropriate monitor, with certain restrictions.

Multisync – A kind of monitor which can accept a signal at a variety of frequencies, usually ranging from 15KHz to 32KHz. A multisync is useful for displaying a signal produced by a "flicker-fixer".

RGB – Red Green Blue; one of three common standards for video signals. RGB provides better quality than composite or RF (Radio Frequency) signals, but you need an RGB monitor to be able to display the signal.

YC – A less common video signal format, providing superior quality because the brightness (Y) and colour (C) components of the signal are processed separately and do not need to be decoded from a mixed or composite signal, meaning less quality loss.

256 images (both HAM and 32 colour) it just kept crashing on me – which I don't remember it doing before! Version 1.04f works fine though. ***GW***

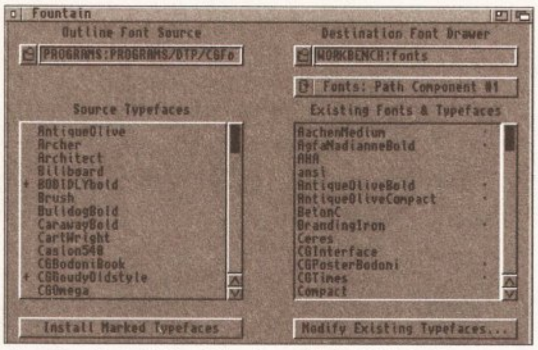
FORMAT FRUSTRATION

I have some GIF format pictures from my brother's PC which I want to transfer to my Amiga 500 Plus, but no-one I know has any idea how to do this. Can you help?
Mike Proctor,
Windsor

There are several ways of doing this, some cheap, some expensive.

There are several PD programs which can help you out. *ViewTEK* can display GIFs and save them as IFF files, but the conversion it does is rather crude. A better program is *Rend24,* which can also scale, dither and allow different IFF formats to be specified for the save. It can also handle JPEG images, should you need to do these too. *ViewTEK* needs at least AmigaDOS 2.04, while *Rend24* can use AmigaDOS 1.3 or greater. There are several other PD programs, including *WASP,* which can also be used.

On the commercial side, ASDG's *Art Department Professional,* GVP's *ImageFX* and Black Belt's *ImageMaster* will all do the job, but of course they all cost far more than PD programs would. ***GW***



Wondered what Fountain (supplied with Workbench 2.04) is for? Use it to convert fonts to a usable format.

NOT SO FONTASTIC

I have a lot of Compugraphic fonts which I'd like to use with my various paint and 3D programs but even though I have Workbench 2.04 they just don't seem compatible. I thought that AmigaDOS 2.04 could handle Compugraphic fonts, but I can't seem to get them to work, no matter what I do.
Shelley Parks,
Plymouth

You don't say what the source of your Compugraphic fonts is, so I can't entirely sort out the matter, but there are enough differences between the AmigaDOS Bullet format (as licensed by Commodore from Agfa and supplied with Workbench 2.04) and Agfa's own true Compugraphic format (as used by certain DTP programs) to make them incompatible.

However, don't despair. If your fonts came from Agfa as a collection of IntelliFonts (which are the same as Bullet fonts) they can be loaded and accessed directly from any Bullet-friendly program, but if your Compugraphic fonts came with a DTP program such as *Professional Page* you'll have to use the *Fountain* program supplied with WB 2.04 to convert them to Bullet-type fonts suitable for use with AmigaDOS.

You can also use *Fountain* to make bitmap fonts of any sizes that you might regularly use – this will speed things up, because every time a Bullet font is requested it has to be internally converted to a bitmap font anyway before it can be displayed. It follows that you'll avoid an extra wait if you have the room to store a range of pre-made bitmap versions of your Bullet fonts. ***GW*** AS

STILL GOT A PROBLEM? JUST USE THE FORM BELOW TO ASK OUR EXPERTS!

If you send in a question for the Amiga Answers experts, please fill in and include the form below (or a photocopy if you don't want to cut up your magazine). And please also make sure that you include all the relevant details – version numbers of software and so on – so that we have the best chance of helping you.

Send your form and question to: Amiga Answers, *Amiga Shopper*, 30 Monmouth Street, Bath, Avon BA1 2BW. Sorry, but we cannot reply personally to any questions – even if you include an SAE.

Name: ____________________

Address: ____________________

____

____

Your machine:

A500 ☐ **A500 Plus** ☐ **A600** ☐ **A1000** ☐ **A1200** ☐

A1500 ☐ **A2000** ☐ **A3000** ☐ **A4000** ☐

Approximate age of machine: ____________________

Kickstart version (displayed at the "insert Workbench" prompt)

1.2 ☐ **1.3** ☐ **2.x** ☐

Workbench revision (written on the Workbench disk)

1.2 ☐ **1.3** ☐ **1.3.2** ☐ **2.x** ☐ **3.0** ☐

PCB revision (if known). Do not take your machine apart just to look for this! ____________________

Total memory fitted (see AVAIL in Shell for Workbench 1.3) ____________________

Chip memory available (see AVAIL in Shell) ____________________

Agnus chip (if known) ____________________

Extra drive #1 (3.5in/5.25in) as DF__: Manufacturer ____________________

Extra drive #2 (3.5in/5.25in) as DF__: Manufacturer ____________________

Hard disk: ____Mb as DH__: Manufacturer ____________________

Extra RAM fitted – type, size in Mb and manufacturer ____________________

Details of any other hardware which could help us to answer your question:

____

____

____

____

Now, use this space to describe your problem, including as much relevant information as possible. Please continue on a separate sheet if necessary.

____

AS 31

AMIGA

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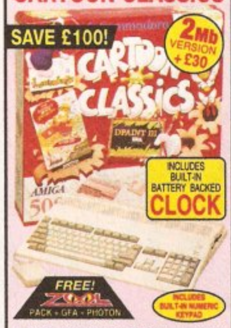
ZOOL - Platform Title of the year - 97% Amiga Comp - Nov '92	£25.99
TRANSWRITE - Word Processor and Spell Checker	£49.95
PINBALL DREAMS - Pinball Simulation - 94% AUI - Sept '92	£25.99
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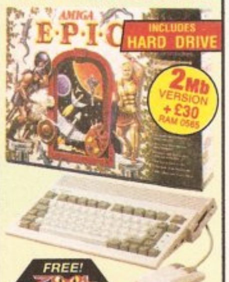
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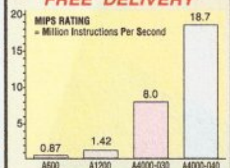
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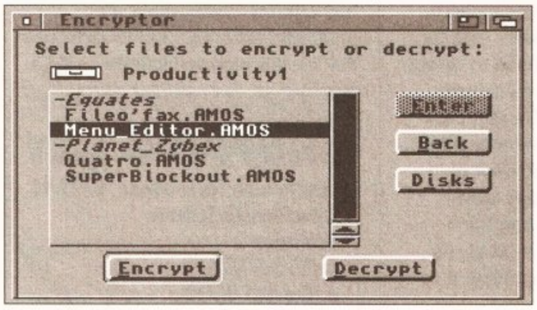
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The Quarterback takes charge

In American football, the Quarterback is like the captain of the team. Gus Chandler wonders what that has to do with Quarterback Tools Deluxe, a package of powerful disk management utilities.

Ever deleted a file by accident, or for that matter found that a disk containing vital information has become corrupted? Well, help is at hand in the form of *Quarterback Tools Deluxe.*

Developed in the States by Central Coast Software, *Quarterback Tools* is a collection of powerful disk management and recovery utilities that will prove invaluable to both the novice and the experienced user alike. While almost all of the *Quarterback* utilities will work with AmigaDOS 1.2 onwards – *Keystroke Finder* being the only exception – the package has been designed to be at its most effective when used with AmigaDOS 2 or 3. You'll need to have at least 512K of memory if you are planning to run *Quarterback Tools* just from floppies and 1Mb if you want to use it with a hard disk. The package will run faster if additional memory is available.



Encryptor – a handy tool for any Amiga user involved in covert activities. Don't forget the password though, or you'll need GCHQ's help to unscramble the data!

Using the package is a cinch. It can all be driven from a series of "clickable button" control screens with further options available from each screen's menu bar. All of the functions of *Quarterback Tools Deluxe* can be accessed quickly. A couple of mouse clicks will take you to practically any part of the suite of tools. Most menu commands can also be invoked through keyboard short-cuts, and some of the most commonly used *Quarterback* options have also been assigned to one of the ten function keys. A lot of other commercial developers would do well to imitate this slickly implemented and intuitive to use interface – it's one of the best that I've seen on the Amiga.

What's more, you can also get at the tools by other methods if you so choose. Most of the functions of the package can be invoked by issuing commands from a Shell window. Furthermore, if you are an ARexx buff then you can use the tools from within your own programs – full ARexx support has been provided. *Quarterback Tools Deluxe* will also enable you to create and save macros. A macro is essentially a list of commands that you want to perform in sequence.

The documentation that is shipped with the package is clear and concise – the 86-page manual is sensibly structured and very readable.

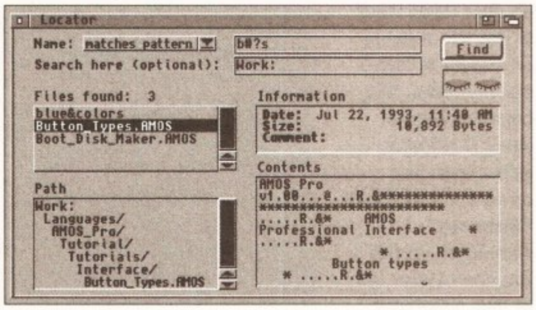
When you open up the *Quarterback Tools* window you see icons for all the different options that the software supports. The first of these – *Quarterback Tools* – is the real heart of the package. It's this integrated set of utilities that will help you sort out the kind of problems with your files that can otherwise prove to be fatal.

From the first control screen you can obtain lots of details on the state of your disks. All you have to do is select **Get Volume Information** from the **Tools** menu. This will provide you with information at two levels. Volume information includes details like the physical and logical size of the volume in both K and blocks, as well as showing the amount of free space remaining. Device information provides you with information at a lower level – things like the size of data blocks and the number of blocks allocated to each disk track. These are the sort of details that you can't obtain easily with AmigaDOS.

This first control screen gives access to four options:

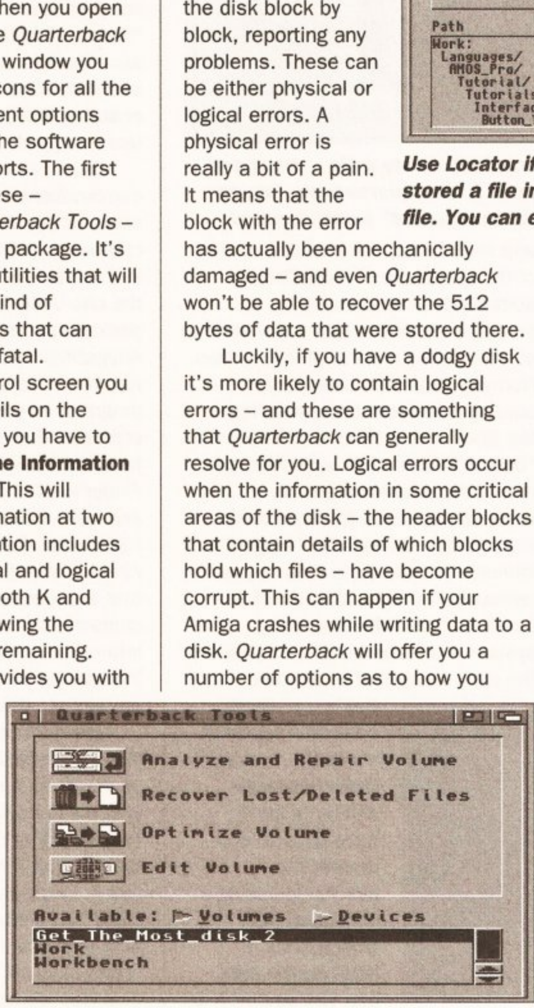
- Analyse and Repair Volume
- Recover Lost/Deleted Files
- Optimise Volume
- Edit Volume

Selecting the first of these – **Analyse and Repair Volume** – gives you the chance to examine and often salvage information from an otherwise corrupted disk. When you choose the **Analyse and Repair** option *Quarterback* scans the disk block by block, reporting any problems. These can be either physical or logical errors. A physical error is really a bit of a pain. It means that the block with the error has actually been mechanically damaged – and even *Quarterback* won't be able to recover the 512 bytes of data that were stored there.



Use Locator if you can't remember what drawer you stored a file in. Locator will show you the path to the file. You can even search for files using "wildcards".

Luckily, if you have a dodgy disk it's more likely to contain logical errors – and these are something that *Quarterback* can generally resolve for you. Logical errors occur when the information in some critical areas of the disk – the header blocks that contain details of which blocks hold which files – have become corrupt. This can happen if your Amiga crashes while writing data to a disk. *Quarterback* will offer you a number of options as to how you want the software to tackle a particular error and then attempt to repair the disk for you.



The main control screen from Quarterback – if you've got a recalcitrant disk then this is where to start. You can even optimise a disk to reduce fragmentation.

The second option from the main control screen – **Recover Lost/Deleted Files** – can be a real lifesaver. When you delete a file only the directory reference to it is altered – the data remains until AmigaDOS comes to want to write something new to that area. Click on the **"Scan"** button on the **Recover Lost/Deleted Files** control screen and the program will check the disk and report all the files that it can find that have been deleted. It will also give you details on whether any of the blocks that make up a particular file have been overwritten. If you then want to restore a file, you just have to select its name from the list and hit the **Start** button.

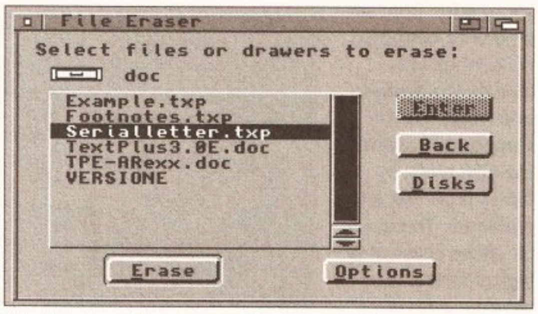
Optimise Volume is another of *Quarterback Tools'* powerful features. If you've been using a disk for a while, frequently saving new files and deleting old ones, then your disk will have to some extent become what is known as fragmented. This occurs because files are broken up into blocks (512-byte chunks) for storing on the disk. Now, on a perfectly unfragmented disk the blocks that a file breaks down into will be stored contiguously – that is, one after the other. On a badly-fragmented disk, however, the blocks may end up being scattered all over the disk. That's not a

problem to the Amiga – but what it does mean is that the speed at which information can be both read from and written to the disk will be reduced. Using *Quarterback's* **Optimise** tool will "rebuild" the disk, defragmenting your files.

Edit Volume – the last of the main control screen options – is a powerful disk sector editor that will prove valuable to the advanced user. **Edit Volume** enables you to select and display information from your disk a block at a time. You can then edit this data byte by byte.

MORE GOODIES

Now, let's take a look at all the other goodies included with *Quarterback Tools Deluxe*. First comes *Replicator*. This is a sophisticated disk duplicating system intended for producing multiple copies. It works by first copying an image of the disk that you want to duplicate into the Amiga's memory. This means that you'll have to have at least 880K of free RAM available – and twice that amount if you want to get into running off copies of high-density disks. The big advantage of using *Replicator*, rather than just using the AmigaDOS **"Diskcopy"** command, is that you can master up to four disks at a time – depending of course on how many floppy drives you actually have attached to your system.

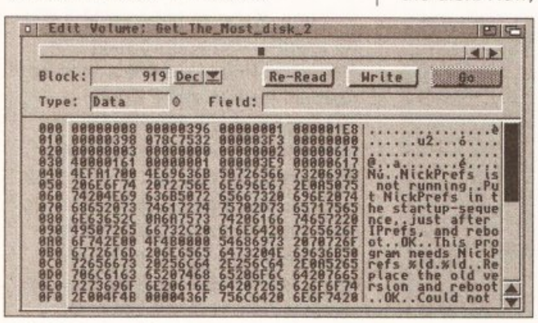


File Eraser will permanently delete a file – you won't even be able to recover it with Quarterback. You can even choose the "US Government" erase standard.

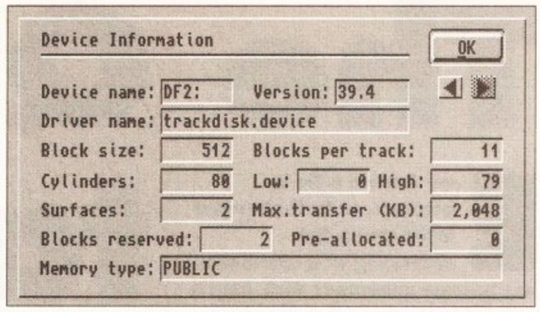
Then there's *Locator* – a really handy little utility for tracking down files that appear to have gone AWOL. You'll no longer have to spend unproductive evenings opening every drawer on your hard drive just to find where you actually saved that vital file. To use *Locator* you simply specify a search pattern for the file name. This can include any of the AmigaDOS wild-card characters. So for example, searching for **"b#?s"** will track down any files that have names which both start with a **"b"** and end with an **"s"**. *Locator* displays the names of all the files that match the specified search criteria. Clicking on one of the displayed file names will give details of the full path to the file. Also displayed is information about the file – when it was last modified and its size. *Locator* also displays the first couple of hundred bytes of the file data – not desperately useful for binary files, but handy if you want to see at a glance just what that text document actually says.

If you want to guard the data you keep on your disks from prying eyes, then *Encryptor* is just the job. You simply give each file that you want to encrypt a password (these are case sensitive) and then click on the **Encrypt** button. Don't forget the password that you use though – because otherwise there's no way that you'll be able to unscramble the encrypted file. To decrypt, just enter the password and hit the **Decrypt** button. Both processes are performed very quickly.

Two utilities called *File Eraser* and *Disk Eraser* are provided as part of the *Quarterback Tools Deluxe* suite. These can be used to permanently delete files or erase a complete disk's worth of information. Normally, if you erase a file by issuing a "delete" command from the Shell or selecting the Workbench **"Delete"** option then what happens is that the data isn't actually physically removed from the disk. Instead, the file name is "tagged" to indicate that the file's data can be removed. The data itself won't be overwritten until the operating system comes to reuse the space on the disk. Now, a lot of the time, that's a perfectly adequate approach – indeed, it means that if you have deleted a file in error you can still recover the information using a disk utility like *Quarterback*. If however the data that you deal with is confidential, then it may well be that when you come to delete it you really do want to be sure that it has been irrevocably removed from the medium – and that's what these two utilities are for. They actually overwrite the sectors on the disk that held the file you wanted to delete. You can even choose to overwrite the information 100 times – if you're really paranoid about destroying the last vestiges of residual magnetism.



Edit Volume – if you want to alter the data on your disk a byte at a time, Quarterback gives you the tools to do it. An easy way to completely trash a file, this.



Device information – low-level details about the current state of your disks, so if you want to know what device driver is in use, all you need to do is look here.

System Mover is a tool that provides a handy alternative to the Shell when it comes to installing and removing fonts or shuffling other system files – like printer drivers – about. The utility handles eight types of system files: Fonts, Printers, Keymaps, Libraries, Devices, Handlers, CLI Commands and CLI Scripts. It's dead simple to use – you don't need to know anything about what's actually in the files – and for installing files you just have to select from a directory menu the source and destination of the file and click on the copy button. To remove files you just select them and click on a **"Remove"** button. *System Mover* also displays version information about the files – which is handy for ensuring that you are installing the latest copy of the file.

Can't remember what key combinations are used to access some of the Amiga's extended ASCII character set? Well, *Keystroke Finder* is there as an *aide memoire*. This is the one utility in the *Quarterback* package that requires at least AmigaDOS version 2.0 or higher to run, but it's a very simple little program. All you do is click on the character that you wish to identify – for example, ë – and *Keystroke Finder* will tell you both the decimal and hex value of the character's ASCII code. Furthermore, *Keystroke Finder* also tells you the keystrokes that are required to call up the character on screen – so all your letters to German friends can incorporate umlauts at the appropriate point.

Brain Cloud is the final utility in the *Quarterback Tools Deluxe* package. Its function is to protect your disks from being accidentally erased. What it does is to modify the disk so that AmigaDOS can no longer use it. Once you've put a "brain cloud" on a disk you won't even be able to format it. If you insert a "brain clouded" disk into a drive, a disk icon will appear on the Workbench screen with the narrative **"DF0:BUSY"** and the operating system will from then on resolutely refuse to touch it. One mouse click will "cloud" or "uncloud" a disk.

TOUCHDOWN!

Quarterback Tools Deluxe provides a wide range of useful utilities for looking after your disks. Some functions – like **Optimise Volume** – will help you improve your system's performance. Others, like **Recover Lost/Deleted Files,** may one day save you from losing vital data. If you use disks intensively, then a disk management package is an important resource, and *Quarterback* fits the bill very well indeed. AS

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CHECKOUT QUARTERBACK TOOLS DELUXE

Features
●●●●●●●●●○
A very comprehensive range of file-management and disk-recovery utilities.

Documentation
●●●●●●●●●○
Very good. The manual is well-presented and easy to read.

Ease of Use
●●●●●●●●●●
A wonderfully intuitive user interface. A joy to "drive".

Performance
●●●●●●●●●○
The whole suite of utilities perform admirably.

Value for Money
●●●●●●●●○○
This is a great package – but 130 quid is a little pricey.

Overall rating
●●●●●●●●●○
Excellent. *Quarterback Tools Deluxe* is ideal for looking after your disks.

Readers' Listings

This month no less than three readers get their names in lights and win £25 for their listings.

This month we're featuring three useful and interesting AMOS routines. They were contributed by Matthew Chapman from Bournmouth, Graham Lund of Silsley near Keighley and Mike Robson from Easington in Cleveland, each of whom wins a crisp new cheque for £25.

What's more, with the return of the *Amiga Shopper* cover disk this issue you don't even have to strain your fingers typing in the code yourself – the code for these three routines can all be found in the **Listings** drawer on the cover disk.

We're always interested to receive listings from readers – and remember, any that we print earn the sender the grand sum of £25. Please send us a printout of the program along with a disk containing copies of all the files on it (source code, object code if any, plus all of the appropriate documentation). Don't forget, it is theft to use any code written by someone else without permission, so don't do it, and please enclose a signed declaration that your code is all your own work.

The symbol ☛ means do not type a return – keep typing to the end of the next line. ▼☛ means type a space, then keep typing to the end of the next line.

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The first of this month's AMOS offerings – *Maze Master* by Matthew Chapman – is an interesting routine that will find the shortest path through a randomly-generated maze. Note that you need to use AMOS Professional to generate a large maze with this routine; otherwise you are limited to about 12 units, which is not really going to be very challenging, either for you or for the route-finding part of Matthew's program.

```
' *** Maze Master ***
'
'          M.P.Chapman.   1993.
'
' 1) Randomly generates a maze.
' 2) Finds the direct route through
'    a maze.
'
' Increase variable space
Set Buffer 50
' Increase stack size
' NOTE: This command is AMOS Pro only.
' ****  Without it the maximum maze size
'          is restricted (to about 12 units).
Set Stack 3000

Screen Open 0,320,256,4,Lowres
Screen Display 0,,40,,
Palette $FFF,0,$F00,$FE0
Colour Back $FFF
Limit Mouse 130,42 To 400,287
Flash Off : Cls 0 : Paper 0 : Ink ,0
Print Pen$(1)+"Random maze generator."
Print Pen$(2)
Print "Generates a square maze, and"
Print "finds direct route through maze."
Print
Input "Size of maze (10-50 best): ";SIZE
' create border around maze
SIZE=SIZE+2
Cls : Curs Off : Locate 0,29
Print "Generating maze..."
' DIST is size of squares drawn on
' screen, set to fit maze on screen.
DIST=230/SIZE
' define array, with extra border
Dim MAZE(SIZE+1,SIZE+1)

CREATE_MAZE[SIZE]
Cup : Cline
Print "Finished maze: (from yellow to yellow)"
Print "Press a key to solve maze."
Wait Key
Cup : Cline : Cup : Cline
Print "Traversing maze..."
TRAVERSE_MAZE[XST,YST,XEND,YEND]
Cup : Cline
Print "Direct route is in yellow."
Print "Press a key to end."
Wait Key : End

Procedure CREATE_MAZE[MSIZE]
   ' Generates a random square maze
   ' with a unique solution.
   ' It is stored in the array MAZE.
   ' MSIZE is the required size.
   ' XST,YST and XEND,YEND are set to
   ' the start and finish of the maze.

   Shared MAZE(),DIST,XST,YST,XEND,YEND

   ' fill maze (1=wall, 0=path)
   For DN=1 To MSIZE
      For AC=1 To MSIZE
         MAZE(AC,DN)=1
      Next AC
   Next DN

   ' start creation at centre
   X=MSIZE/2
   Y=MSIZE/2

   ' creates maze
   SQUARE[X,Y,2]
   MAZE(X,Y)=0
   EXTEND_MAZE[X,Y]

   ' select start and finish for maze
   XST=2
   Repeat
      YST=Rnd(MSIZE-4)+2
   Until MAZE(XST,YST)=0
   SQUARE[XST-1,YST,3]
   XEND=MSIZE-1
   Repeat
      YEND=Rnd(MSIZE-4)+2
   Until MAZE(XEND,YEND)=0
   SQUARE[XEND+1,YEND,3]
End Proc

Procedure EXTEND_MAZE[X,Y]
   ' This procedure actually creates
   ' the maze. It randomly extends the
   ' maze one square, if possible, and
   ' then calls itself (recursion) with
   ' the new position.

   Shared MAZE()

   ' With a smaller x for Rnd(x) below,
   ' the maze will generally have longer
   ' branches, making it harder, but
   ' will also be more sparse.
   ' WARNING: if x is too low compared
   ' with the maze size, then the maze
   ' will not reach the edges, and the
   ' select start/finish secton of
   ' CREATE_MAZE will not end.
   If Rnd(30)<>0
      For REP=1 To 2
         If((Rnd(1)=0 or REP=2) and ▼☛
MAZE(X,Y-1)=1 and MAZE(X-1,Y-1)=1 and ▼☛
MAZE(X+1,Y-1)=1 and MAZE(X-1,Y-2)=1 and ▼☛
MAZE(X+1,Y-2)=1 and MAZE(X,Y-2)=1)
            SQUARE[X,Y-1,2]
            MAZE(X,Y-1)=0
            EXTEND_MAZE[X,Y-1]
         End If
         If((Rnd(1)=0 or REP=2) and ▼☛
MAZE(X-1,Y)=1 and MAZE(X-1,Y-1)=1 and ▼☛
MAZE(X-1,Y+1)=1 and MAZE(X-2,Y-1)=1 ▼☛
and MAZE(X-2,Y+1)=1 and MAZE(X-2,Y)=1)
            SQUARE[X-1,Y,2]
            MAZE(X-1,Y)=0
            EXTEND_MAZE[X-1,Y]
         End If
         If((Rnd(1)=0 or REP=2) and ▼☛
MAZE(X,Y+1)=1 and MAZE(X-1,Y+1)=1 and ▼☛
MAZE(X+1,Y+1)=1 and MAZE(X-1,Y+2)=1 and ▼☛
MAZE(X+1,Y+2)=1 and MAZE(X,Y+2)=1)
            SQUARE[X,Y+1,2]
            MAZE(X,Y+1)=0
            EXTEND_MAZE[X,Y+1]
         End If
         If((Rnd(1)=0 or REP=2) and ▼☛
MAZE(X+1,Y)=1 and MAZE(X+1,Y-1)=1 and ▼☛
MAZE(X+1,Y+1)=1 and MAZE(X+2,Y-1)=1 and ▼☛
MAZE(X+2,Y+1)=1 and MAZE(X+2,Y)=1)
            SQUARE[X+1,Y,2]
            MAZE(X+1,Y)=0
            EXTEND_MAZE[X+1,Y]
         End If
      Next REP
   End If
End Proc

Procedure TRAVERSE_MAZE[X,Y,XEND,YEND]
   ' Solves maze by hugging left edge.
   ' Stores path in ROUTE$ as a series
   ' of x,y coordinates, and eliminates
   ' dead ends, to give direct route.

   Shared MAZE(),DIST

   ' function to convert coordinates
   ' into a string, for storage
   Def Fn CONV$(XC,YC)=(Str$(XC/10)+Str$☛
(XC mod 10)+Str$(YC/10)+Str$(YC mod 10))-" "
   ROUTE$= Fn CONV$(X,Y)

   DX=0 : DY=-1
   Repeat
      ' calculate next position,
      ' following left edge.
      If DX=0
         CX=DY : CY=DX
      Else
         CX=DY : CY=-DX
      End If
      If MAZE(X+CX,Y+CY)=0
         X=X+CX : Y=Y+CY
         DX=CX : DY=CY
      Else
         If MAZE(X+DX,Y+DY)=0
            X=X+DX : Y=Y+DY
         Else
            If MAZE(X-CX,Y-CY)=0
               X=X-CX : Y=Y-CY
               DX=-CX : DY=-CY
            Else
               X=X-DX : Y=Y-DY
               DX=-DX : DY=-DY
            End If
         End If
      End If

      XY$= Fn CONV$(X,Y)
      ' if x,y = coordinates before
      '          latest ones
      If XY$=Mid$(ROUTE$,Abs(Len(ROUTE$)-7),4)
         ' delete latest
         ROUTE$=Left$(ROUTE$,Len(ROUTE$)-4)
      Else
         ' add x,y to route
         ROUTE$=ROUTE$+XY$
      End If

      ' slow down traversal
      For DELAY=1 To 10
         X Mouse=X Hard(X*DIST+DIST/2)
         Y Mouse=Y Hard(Y*DIST+DIST/2)
      Next DELAY
   Until X=XEND and Y=YEND

   ' display route
   For ALONG=0 To Len(ROUTE$)/4-1
      SEG$=Mid$(ROUTE$,ALONG*4+1,4)
      X=Val(Left$(SEG$,2))
      Y=Val(Right$(SEG$,2))
      SQUARE[X,Y,3]
```

```
   Next ALONG
End Proc

Procedure SQUARE[X_TOP,Y_TOP,CLR]
   ' Draws a square, size DIST, at given
   ' coordinates, scaled by DIST
   Shared DIST
   Cls CLR,X_TOP*DIST,Y_TOP*DIST
To(X_TOP+1)*DIST,(Y_TOP+1)*DIST
End Proc
```

Graham Lund's contribution to the *Amiga Shopper* listings section this issue is this useful little routine, which enables you to enter text using the joystick. Invaluable for that authentic arcade feel when you're entering your high score, or if your keyboard's knackered...

£25 WINNER

```
Rem   ***          JOYSTICK            ***
Rem   ***       By Graham Lund         ***

'
Screen Open 0,320,256,4,Lowres
Curs Off : Flash Off : Hide
Palette 0,$FFF,$11F,$FF0
Paper 0 : Cls
'
Rem   Set up a string to hold the ▼☛
letters to be used
'
  LETTR$="ABCDEFGHIJKLMNOPQRSTUVWXYZ., "
'
Rem   Draw and grab a bob to be ▼☛
used to highlight chosen letter
'
  Ink 3,0
  Box 0,0 To 23,10
  Get Bob 1,0,0 To 24,11
  Cls 0
'
Rem   Enter programmes title and ▼☛
explain how to choose a letter
'
  Pen 3
  Locate 0,4 : Centre "ENTERING TEXT ▼☛
USING JOYSTICK"
  Pen 2
  Locate 0,25 : Centre "Highlight ▼☛
letter by moving joystick."
  Locate 0,27 : Centre "Press FIRE to ▼☛
select letter."
'
Rem   Place the letters on the screen
'
  Pen 1
  Locate 4,17 : Print "A  B  C  D  E  ▼☛
F  G  H  I  J"
  Locate 4,19 : Print "K  L  M  N  O  ▼☛
P  Q  R  S  T"
  Locate 4,21 : Print "U  V  W  X  Y  ▼☛
Z  .  ,    end"
'
Rem   Draw a box to hold the name
'
  Locate 0,8 : Centre "Name Box."
  Ink 2 : Box 100,74 To 200,92
  Ink 3 : Box 99,73 To 201,93
  Ink 2 : Box 98,72 To 202,94
'
  Proc _ENTERNAME
  End
'
Procedure _ENTERNAME
Rem  List the shared variables
'
  Shared N$
  Shared UP,LFT,DWN,RGHT,BX,BY,W,NAMEEND
'
Rem  Enter initial values for the ▼☛
shared variables
'
  UP=1 : LFT=1 : DWN=0 : RGHT=0 : ▼☛
W=1 : NAMEEND=0
  BX=24 : BY=134
  NAME$=""
  LETTER=0
'
Rem  Place the bob grabbed above ▼☛
around the first letter
'
  Bob 1,BX,BY,1
  Pen 3
'
Rem  This part calls the procedure ▼☛
_PICKLETTER repeatedly until
Rem  seven letters have been chosen ▼☛
at which point the repeat
Rem  until loop is completed. The ▼☛
letters are entered into the
Rem  string NAME$ by adding the ▼☛
string N$ to it each time a
Rem  letter has been chosen and ▼☛
the string is displayed.
'
Repeat
  Proc _PICKLETTER
  NAME$=NAME$+N$
  Locate 15,10 : Print NAME$
  Inc LETTER
  If NAMEEND=1 Then LETTER=7
Until LETTER=7
End Proc
'
Procedure _PICKLETTER
  Shared N$,LETTR$
  Shared UP,LFT,DWN,RGHT,BX,BY,W,NAMEEND
'
Rem  This Repeat - Until loop ▼☛
reads the joystick and will only
Rem  move the bob if the move ▼☛
is allowed by the values held in
Rem  UP DWN LFT and RGHT
'
Q=0 : N$=""
Repeat
  If LFT=0 and Jleft(1)
    BX=BX-24 : RGHT=0 : Dec W
  Else If RGHT=0 and Jright(1)
    Add BX,24 : LFT=0 : Inc W
  Else If UP=0 and Jup(1)
    BY=BY-16 : DWN=0 : W=W-10
  Else If DWN=0 and Jdown(1)
    Add BY,16 : UP=0 : Add W,10
      End If
    End If
  End If
End If
  Bob 1,BX,BY,1
  Wait 10
  If BX=24 Then LFT=1
  If BX=240 Then RGHT=1
  If BY=134 Then UP=1
  If BY=166 Then DWN=1
  If Fire(1) Then Bell 70 : Q=1
Until Q=1
'
Rem  A value of 30 for W means ▼☛
no more letters are needed
Rem  so the NAMEEND variable is incremented
'
  If W=30 Then NAMEEND=1 : N$=""
'
Rem  The correct letter is retrieved ▼☛
from the LETTR$ string and
Rem  fed into the N$ string
'
  If W<30
    N$=Mid$(LETTR$,W,1)
  End If
End Proc
```

Michael Robson is the contributor of our third program this month. It's a simple implementation of a high-score table – but could be easily combined with the previous listing for entering text via the joystick.

£25 WINNER

```
'{ High score table with parallax starfield }
'{ By Michael Robson, March 1993 }

'{ NB: When using dual playfields ☛
always set screen to 0 before }
'{     using comands like fade and ☛
colour otherwise they will    }
'{     have no effect. }
Hide On
'{ Set up arrays to hold star positions }
Dim STARS_1(20,1),STARS_2(10,1),STARS_3(5,1)
Global STARS_1(),STARS_2(),STARS_3()
Global S_HEIGHT,_FONT_NUM,TW
_INITIALIZE
Default Palette
$0,$FFF,$AAA,$777,$0,$FFF,$777,$333,☛
$FFF,$FFF,$777,$333,$0,$FFF,$777,$333
'{ Open two 4 colour screens for dual ☛
playfields }
Screen Open 0,320,S_HEIGHT,4,Lowres
Flash Off
Curs Off
Cls 0
Set Font _FONT_NUM
Screen Open 1,320,S_HEIGHT,4,Lowres
Flash Off
Curs Off
Cls 0
Set Font _FONT_NUM
Double Buffer
Autoback 0
Screen Display 0,128,45,320,256
Screen Display 1,128,45,320,256
Wait Vbl : Dual Playfield 0,1
Screen 0 : Cls 0 : Screen Swap : Cls 0
'{ Set position and height of logo }
L_LINE=200 : L_HIGH=50
'{ Place High score logo here at line ☛
L_LINE }
'{ example, Paste Icon 0,l_line,1 }

'{ Example Logo using text but you could ☛
use an icon from the icon bank }
' paste icon 0,l_line,1
Ink 1,0 : X_POS=(320-(TW*39))/2

Text X_POS,L_LINE+5,"# # ### ### # ☛
#    ### ### ### ### ### "
Text X_POS,L_LINE+15,"# #  #  #   # ☛
#    #  #   # # # # #   "
Text X_POS,L_LINE+25,"###  #  #    ☛
### ### ### #   # # ### ### "
Text X_POS,L_LINE+35,"# #  #  # # # ☛
#      # #   # # ##  #   "
Text X_POS,L_LINE+45,"# # ### ### # ☛
#    ### ### ### # # ### "
Text X_POS,L_LINE+55,"          "

Screen 1
'{ Set scroll speed S_SPEED and scroll logo }
S_SPEED=4
For LP=L_LINE To 10 Step -S_SPEED
   _STARS
   Screen Copy Physic(0),0,LP,320,LP+52 ☛
To Logic(0),0,LP-S_SPEED : Wait Vbl
Next LP
_STARS : Screen Copy Physic(0) To Logic(0)

'{ Display high scores on screen 0 }
'{ For use in your own programs use an ☛
array to hold the scores }

For LP=120 To 200 Step 10

   SCORE$=" Mike ....... 25000
   '{ or SCORE$=array$(lp/10) }

   Screen 0
   Autoback 1
   Ink 1,0
   Text((320-(TW*20))/2)-TW,LP,Str$( ☛
(LP-110)/10)+SCORE$
   Autoback 0
   Wait Vbl
   Wait 1
   Screen 1 : _STARS
Next LP

'{ Display stars and wait for user to ☛
click mouse to exit }

Screen 1
Do
   _STARS
   If Mouse Key=1
      Screen 0 : Fade 1 : Wait 15 : Exit
   End If
Loop
'{ Return to the editor }
Edit
Procedure _INITIALIZE
Procedure _STARS
```

That's all for this time around. If you've written a routine you'd like to share, send it in to *Amiga Shopper* and you too could win £25.

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AMOS Action

Add colour to your AMOS paint program, with Jason Holborn's expert guidance.

The symbol ☞ means do not type a return – keep typing to the end of the next line. ▼☞ means type a space, then keep typing to the end of the next line.

It's time to enhance the toolbar we talked about last month. We're going to add the code to handle its various gadgets, and also get a colour requester up and running.

Our colour selector attaches to the toolbar strip and enables you to instantly select a colour to paint with simply by clicking on it with the mouse.

Add the code shown in the listings box on page 70 to the program you already have. Those lines preceded by asterisks ("*") won't need to be entered – they're already part of the program you've entered over the last two months and are shown so you can see how the new code fits around them. The new procedures that make up the bulk of the code here should be added to the end of your program. Notice that the **_TOOLDRAG** procedure, which you've already entered, has been changed here and needs to be replaced. (Alternatively, you'll find the full paint program so far on the cover disk – see page 12.)

1. Our colour selector consists of a single close gadget and up to 32 colour selection gadgets. In order to handle all these gadgets, we need to initialise an array that will hold the X and Y co-ordinates of the top left hand corner of each gadget.

2. Two new global variables are defined. **SELECTCOL** is used as a flag variable to let the rest of the program know when the colour selector screen is open, and **SCRYPOS** is used to tie the colour selector to the toolbar strip when the user drags it around the screen.

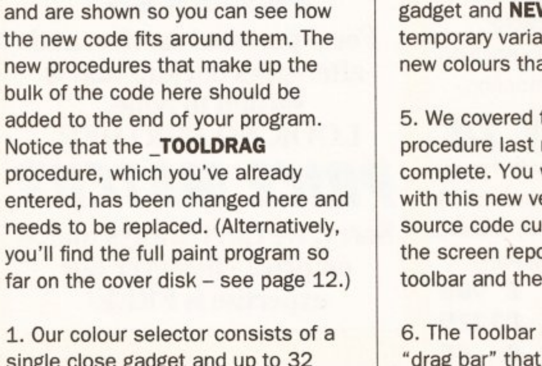
3. **XRATIO** and **YRATIO** are two global variables that define the size ratio of the 32 colour selection gadgets. By calculating a size ratio, the entire colour selector screen is filled with colour gadgets regardless of the number of colours available.

4. The **CGADG** array defined in line 1 is made into a global variable (making it accessible to all procedures). **REDRAWCBORDER** is a flag that tells the gadget handling code when to redraw the border around the currently selected colour gadget and **NEWCOLOR** is a temporary variable used to store any new colours that you select.

5. We covered the **_TOOLDRAG** procedure last month, but it was not complete. You will need to replace it with this new version to keep your source code current. It now handles the screen repositioning of both the toolbar and the colour selector.

6. The Toolbar has a rectangular "drag bar" that when clicked upon will enable both the toolbar and colour selector to be dragged up and down the screen. This drag bar is defined as screen zone 22, so we need to check whether the mouse is in this region and that the left mouse button is being held down.

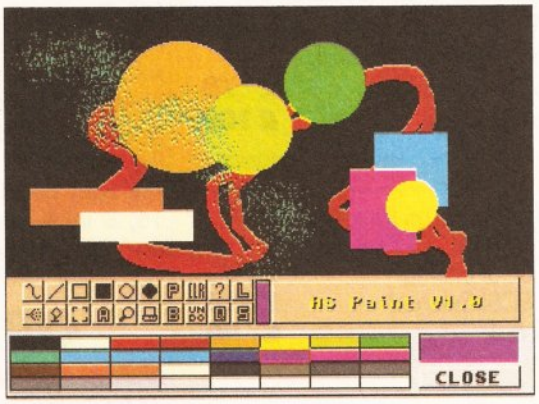
7. If it is, the position of the toolbar and colour selector is calculated by subtracting 15 from the current Y screen co-ordinate of the mouse pointer. The result is then placed into a variable called **SCRYPOS**.



Our colour selector isn't just a pretty face – it's intelligent too. As you can see, the colour gadgets are scaled according to how many colours you select.

8. Because the Toolbar and colour selectors live in their own separate screens, they're moved separately. First we move the toolbar using the **ScreenDisplay** command.

9. If the colour selector screen is opened (indicated by checking for a value of **1** in the **SELECTCOL** variable), the colour selector screen is repositioned exactly 15 pixels below the toolbar screen.



Here's our AMOS paint program so far, complete with its new pop-up colour selector screen. Looks good, eh?

10. It's time to make the toolbar gadgets work for their keep with the **_CHECKICONS** procedure.

11. If the left mouse button has been depressed, then the screen zone that the mouse pointer lies over will be put in a variable called **ICON**.

12. The mouse pointer may not be in a screen zone, so we next check to see that **ICON** contains more than just a value of **0**.

13. If a gadget is selected, the first step is to highlight it, which is done by calling the **_HIGHLIGHTICON** procedure.

14. Only certain gadgets are of interest to us, so we next check to see whether the selected gadget is one of the 20 tool icons.

15. If it is, a flag variable called **SELECTED** is set to the number of the selected icon.

16. If the variable **SELECTED** was set to a value greater than zero, we know that a new paint tool has been selected. The code that handles all the program's various painting tools will be inserted within this control structure in the future.

17. Two parameters need to be passed to the **_HIGHLIGHTICON** procedure – the number of the new gadget and the number of the last gadget that was selected (this will be de-selected).

18. We check that the gadget selected is one of the 20 tool gadgets and that it isn't already selected.

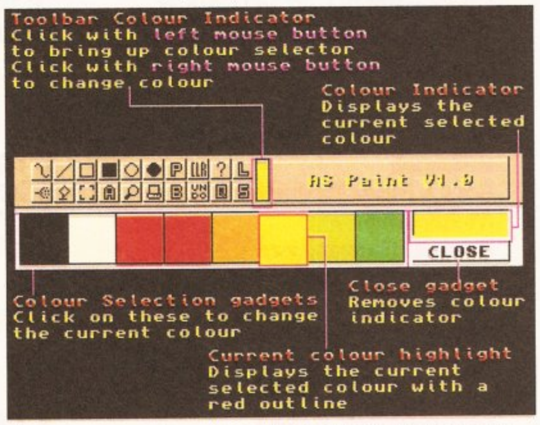
19. Now we need to de-select the previous gadget. We check that the variable **OLD** contains a value greater than **0**. If it contains **0**, then we know that a gadget hasn't been selected.

20. If a gadget *has* previously been selected, it is de-selected by calling the **_REVERSE** procedure.

21. We then select the new gadget by calling the **_REVERSE** procedure again, which will select de-selected gadgets and vice-versa.

22. Here's the **_REVERSE** procedure.

23. Two variables are required – **GADGSIZE** tells the routine how large each toolbar gadget is (12 x 12 pixels) and **OFFSET** sets the gadget reversal routine slightly right and down of the gadget's top left hand corner.



As you can see here, the colour selector is very easy to use indeed, and is controlled by the mouse.

24. Because we have two strips of gadgets, one on top of the other, we need to decide in which strip the gadget we wish to reverse exists. If it is in the second set of gadgets, its Y co-ordinate is increased accordingly and the value of **ICON** reduced by a value of 10.

25. Finally, the gadget is reversed by setting the draw mode to **JAM2**

(reverse mode) and then drawing over the top of the icon using the **Bar** command. Once this is done, the draw mode is reset to **JAMO**.

26. With the icon handling code out of the way, we can move on to the **_COLORSELECTOR** procedure.

27. It starts by seeing if the user wishes to open up the colour selector with a check to see if zone 21 on the toolbar screen has been clicked on with the left mouse button. A check is also made to make sure that the colour selector hasn't already been opened by ensuring that the variable **SELECTCOL** contains a value of 0. If everything checks out, the colour selector is drawn by calling the **_DRAWCOLSELECTOR** procedure.

28. We check that **SELECTCOL** contains a value of 1 (indicating that the colour selector is open).

29. Here we discover whether the user has clicked on one of the available colour selection gadgets.

30. If so we then check to see whether the colour that they have selected is different from the currently selected colour. If it is, the **NEWCOLOR** variable is passed the value of the selected colour.

31. If a new colour *has* been selected, we need to update the position of the outline that is drawn around the selected colour. This will be done later, but we start by setting the **REDRAWCBORDER** flag to **1**.

32. This is the section of code that re-draws the outline around the current colour. First we check that the **REDRAWCBORDER** variable has been set to **1**.

33. If it has, two variables are initialised to hold the **X** and **Y** co-ordinates of the currently selected colour gadget.

34. We erase the old outline by drawing over the top it using the background colour (colour 0).

35. We get the X and Y co-ordinates of the new colour by interrogating the **CGADG** array.

36. And then we draw the new outline using colour 2 (set to red).

37. We then set the current colour to the new colour, allowing our paint tools to use the new setting.

38. To prevent the outline from being redrawn again, the **REDRAWC BORDER** flag is reset to zero.

39. Now we redraw the box on the colour selector screen that shows which colour is selected. This is done by drawing a rectangle with the **Bar** command.

40. The toolbar window has its own current colour indicator too, which needs to be redrawn by changing the value of colour **4**. The palette setting of the current colour is copied to the toolbar screen's colour **4**.

41. The colour selector's **close** gadget is monitored by checking if the user has clicked the mouse within screen zone 33.

42. If so, the close gadget is reversed twice to make it flash. Then the colour selector screen is closed.

43. Not only is the colour indicator in the toolbar window used to activate the colour selector, but, when clicked on with the right mouse button, it can be used to change the current colour without having to resort to the colour selector. When you click on it with the right mouse button, the next colour in the sequence is selected. We start by checking that the colour indicator has been selected with the right mouse button.

44. If the value in **NEWCOLOR** hasn't been transferred to the **CURCOLOR** variable, we do it now.

45. A value of **1** is added to the contents of **NEWCOLOR**, which selects the next colour in the palette. If the current colour was set to **23**, we would then select colour **24**.

46. If we've selected a colour whose number is greater than the maximum number, **NEWCOLOR** is set to **0**, effectively wrapping the palette selection around.

47. So far all we've done is to update the variable that holds the new colour setting; now we need to transfer the RGB setting of the new colour to the toolbar's colour **4** by reading it from the array **PALTTE()**.

48. If the colour selector screen is open, its colour indicator needs to be re-drawn.

49. Finally we need to redraw the colour gadget outline so that it now points at the new colour setting. This is done simply by putting a value of 1 into the flag variable **REDRAWCBORDER**.

50. This is the procedure that actually draws the colour selector.

51. It starts by opening the colour selector screen using an index number of **1**. Even if we selected only **2** colours from the Screen Format requester, the colour selector is still opened on a 32 colour screen. AMOS's colour cycling and cursor are then turned off and the screen cleared using colour **27** (set to grey by default).

52. In order to position the screen directly below the toolbar, we need to start by checking to see whether the toolbar has been repositioned. If it hasn't (indicated by a value of **0** in the **SCRYPOS** variable), the value of **SCRYPOS** is set to **50**.

53. Here we re-position the colour selector screen by placing it 15 pixels below the toolbar screen.

54. At the moment, the colour selector is on top of the toolbar, so we send it behind the toolbar by bringing screen 7 (the toolbar screen) to the front.

55. Before we can draw any gadgets, we need to ask AMOS very nicely to reserve enough memory for all our gadget screen zones by calling the **Reserve Zone** command.

56. Now we can draw all the colour selector gadgets, but first let's start by drawing the close gadget using a combination of the **Box** and **Draw** commands. Note how the bas-relief effect is added simply by redrawing two of the box's borders in a different colour.

57. Before we can draw all the colour selection gadgets we need to find out how large each gadget should be by calling the **_GETRATIO** procedure.

58. Once we have the X and Y size ratios of the colour gadgets, we draw them all using a simple set of **For...Next** structures.

59. If a gadget needs to be drawn (the number drawn so far being kept track of by the **COUNTER** variable), it is drawn and a screen zone assigned to it. Its co-ordinates are then transferred to the **CGADG()** array. These values are used by the code handling the colour selector gadgets.

60. We draw the current colour display's outline and then fill it with the current colour.

61. The outline round the currently

BEGINNERS START HERE

What is AMOS?

AMOS is a variant of BASIC, a programming language originally designed for beginners. There's nothing trivial about AMOS, though – with it you can write just about any sort of program you want. AMOS is especially tailored to give you easy access to the Amiga's graphics and sound facilities, and as such is good for writing simple games (it hasn't the speed for the more frenetic arcade-style games) and graphics demos. AMOS is an interpreted language.

What is an interpreter?

An interpreter is a program that translates each line of AMOS code into machine code, the language that is understandable to the Amiga's central processor. Programs written with an interpreter are slower than those written with a compiler, because they must be re-translated each time they run. Also, the interpreter must also be loaded into memory, meaning that programs are relatively inefficient in terms of memory consumption. The advantage is that programs are easier to develop; making changes and getting rid of errors is a relatively hassle-free process.

Which AMOS should I get?

There are three variants: Easy AMOS, designed with the beginner in mind (though the paint program featured here is fully AMOS-compatible, so don't be misled into thinking Easy AMOS is no good); the original AMOS The Creator, which has been given away on a couple of magazines' cover disks, and AMOS Professional, which comes with a number of extensions to make it competitive with the likes of C.

How can I make it go faster?

A compiler is now available, compatible with all variants of AMOS. It will translate AMOS programs into stand-alone modules that will run much more quickly, without need for the compiler or the AMOS editor to be present in memory.

Where can I get AMOS?

Easy AMOS costs £34.99; AMOS The Creator £49.99; AMOS Pro costs £49.99; and the AMOS Pro Compiler (also compatible with AMOS and Easy AMOS) costs £34.99. All are available from Europress Software ☎ 0625 859333.

selected colour in the plaette is drawn using colour **2** by reading its co-ordinates from the **CGADG()** array.

62. Finally, we need to let the rest of the program know that the colour selector screen is open by setting the **COLSELECT** flag to 1.

63. The **GETRATIO** procedure is used to scale the colour selector gadgets to fill the entire screen. On a 32-colour screen, the selection gadgets are 8 across and 4 down.

64. By default, the size of each colour selection gadget is set to 30 pixels across and 8 pixels down. These are the values for a 32-colour screen.

65. Four **If...Then** structures are then used to adjust the **XRATIO** and **YRATIO** parameters accordingly. **AS**

LISTING

```
*  SCRMOD=1
*  CLOURS=9
*  CURCOLOR=1
*  Dim GADG(20,4),PALTTE(32)

1. Dim CGADG(33,2)

*  Global SCRMOD,CLOURS,GADG(),PALTTE()
*  Global CURCOLOR

2. Global SELECTCOL,SCRYPOS
3. Global XRATIO,YRATIO
4. Global CGADG(),REDRAWCBORDER,NEWCOLOR

*  MAIN:
*  _SCREENFORMAT
*  _OPENSCREEN
*  _TOOLBOX

*  Repeat
*     _TOOLDRAG
*     _COLORSELECTOR
*     _CHECKICONS[SELECTED]
*     SELECTED=Param
*  Until SELECTED=19

*  End

   Rem *** New Procedures....

5. Procedure _TOOLDRAG
      Screen 7
6.    If Mouse Zone=22 and Mouse Key=1
7.       SCRYPOS=Y Mouse-15
8.       Screen Display 7,,SCRYPOS,,
9.       If SELECTCOL=1
            Screen Display 1,,SCRYPOS+15,,
         End If
         Wait Vbl
      End If
      Screen 0
   End Proc

10.Procedure _CHECKICONS[SELECTED]
      Screen 7
11.   If Mouse Key=1 Then ICON=Mouse Zone
12.   If ICON<>0
13.      _HIGHLIGHTICON[ICON,SELECTED]
14.      If ICON<21
15.         SELECTED=ICON
         End If
      End If
16.   If SELECTED<>0
         Rem *** Icon code goes here!
      End If
      Screen 0
   End Proc[SELECTED]

17.Procedure _HIGHLIGHTICON[ICON,OLD]
18.   If ICON<21 and ICON<>OLD
19.      If OLD>0
20.         _REVERSE[OLD]
         End If
21.      _REVERSE[ICON]
      End If
   End Proc

22.Procedure _REVERSE[ICON]
23.   GADGSIZE=12 : OFFSET=-2
      '
24.   If ICON>10
         Y=4+GADGSIZE
         ICON=ICON-10
      Else
         Y=2
      End If
      Gr Writing 2
25.   X=(GADGSIZE*ICON)+OFFSET+(2*ICON)
      Bar X,Y To X+GADGSIZE,Y+GADGSIZE
      Gr Writing 0
   End Proc

26.Procedure _COLORSELECTOR
      Screen 7
27.   If Mouse Zone=21 and Mouse Key=1 ▼☛
and SELECTCOL=0
         _DRAWCOLSELECTOR
      End If
      Rem *** Is colour selector active?
28.   If SELECTCOL=1
         Screen 1
         Rem *** Has a colour been clicked on?
29.      If Mouse Zone>0 and Mouse Zone<▼☛
33 and Mouse Key=1
30.         If Mouse Zone<>CURCOLOR+1
               NEWCOLOR=Mouse Zone-1
31.            REDRAWCBORDER=1
            End If
         End If
         Rem *** Should I redraw the ▼☛
colour indicator
         Rem *** and the current colour box?
32.      If REDRAWCBORDER=1
33.         CGADGX=CGADG(CURCOLOR,0)
            CGADGY=CGADG(CURCOLOR,1)
            Ink 0
34.         Box CGADGX,CGADGY To ▼☛
CGADGX+XRATIO,CGADGY+YRATIO

35.         CGADGX=CGADG(NEWCOLOR,0)
            CGADGY=CGADG(NEWCOLOR,1)
            Ink 2
36.         Box CGADGX,CGADGY To ▼☛
CGADGX+XRATIO,CGADGY+YRATIO

37.         CURCOLOR=NEWCOLOR
38.         REDRAWCBORDER=0

39.         Ink CURCOLOR
            Bar 251,21 To 309,35
            Screen 7
40.         Colour 4,PALTTE(CURCOLOR)
            Screen 1
         End If
         Rem *** Has the Close gadget ▼☛
been pressed?
41.      If Mouse Zone=33 and Mouse Key=1
            SELECTCOL=0
42.         Gr Writing 3
            Bar 250,40 To 310,52
            Wait 5
            Bar 250,40 To 310,52
            Wait 5
            Screen Close 1
         End If
      End If

      Screen 7
      Rem *** Has the colour active ▼☛
gadget in the toolbox
      Rem *** Been pressed with the ▼☛
right mouse button?
43.   If Mouse Zone=21 and Mouse Key=2
44.      If NEWCOLOR<>CURCOLOR
            CURCOLOR=NEWCOLOR
         End If
45.      NEWCOLOR=CURCOLOR+1
46.      If NEWCOLOR>CLOURS-1
            NEWCOLOR=0
         End If
47.      Colour 4,PALTTE(NEWCOLOR)
48.      If SELECTCOL=1
            Screen 1
            Ink NEWCOLOR
            Bar 251,21 To 309,35
         End If
         Wait 10
49.      REDRAWCBORDER=1
      End If
      Screen 0
   End Proc

50.Procedure _DRAWCOLSELECTOR
51.   Screen Open 1,320,56,32,Lowres
      Flash Off : Curs Off : Cls 27
52.   If SCRYPOS=0
         SCRYPOS=50
      End If
53.   Screen Display 1,,SCRYPOS+15,,
      Get Palette 0
54.   Screen To Front 7

      Reserve Zone 33
55.   Rem *** Initialise 'OK' gadget
      Ink 31 : Box 250,40 To 310,52
      Ink 0 : Draw 250,52 To 310,52
      Draw 310,40 To 310,52
      Gr Writing 0
      Ink 0,7 : Text 259,49,"CLOSE"
      Set Zone 33,250,40 To 310,52
56.   Rem *** Initialise Colour ▼☛
selection gadgets
57.   _GETRATIO
      COUNTER=1
58.   For A=20 To 44 Step YRATIO
         For B=4 To 214 Step XRATIO
59.         If COUNTER<=CLOURS
               Ink 0
               Box B,A To B+XRATIO,A+YRATIO
               Ink COUNTER-1
               Bar B+1,A+1 To B+▼☛
(XRATIO-1),A+(YRATIO-1)
               Set Zone COUNTER,B,A To ▼☛
B+XRATIO,A+YRATIO
               CGADG(COUNTER-1,0)=B
               CGADG(COUNTER-1,1)=A
            End If
            COUNTER=COUNTER+1
         Next B
      Next A

60.   Rem *** Initialise current colour box
      Ink 0
      Box 250,20 To 310,36
      Ink 31
      Draw 250,36 To 310,36
      Draw 310,20 To 310,36
      Ink CURCOLOR
      Bar 251,21 To 309,35

      Rem *** Draw border around ▼☛
colour indicator
61.   CGADGX=CGADG(CURCOLOR,0)
      CGADGY=CGADG(CURCOLOR,1)
      Ink 2
      Box CGADGX,CGADGY To ▼☛
CGADGX+XRATIO,CGADGY+YRATIO
62.   SELECTCOL=1
   End Proc

63.Procedure _GETRATIO
64.   XRATIO=30 : YRATIO=8
65.   If CLOURS=2
         XRATIO=XRATIO*4
         YRATIO=YRATIO*4
      End If
      If CLOURS=4
         XRATIO=XRATIO*2
         YRATIO=YRATIO*4
      End If
      If CLOURS=8
         YRATIO=YRATIO*4
      End If
      If CLOURS=16
         YRATIO=YRATIO*2
      End If
   End Proc
```

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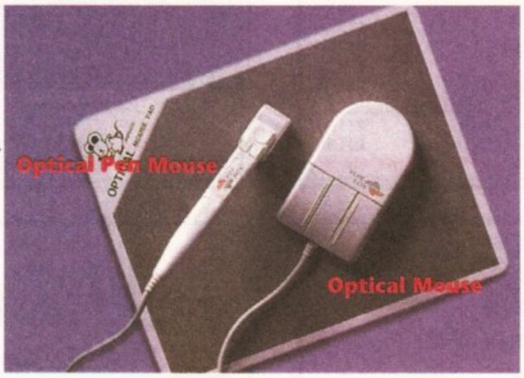
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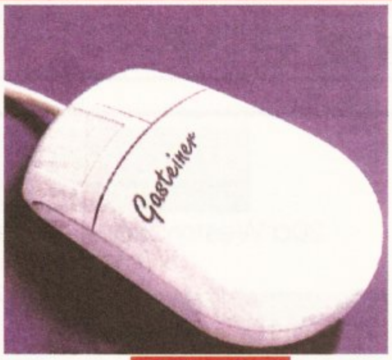
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Access SWITCH VISA

Cracking the Shell

Mark Smiddy shows how to get help from AmigaDOS commands and use this to your advantage.

The symbol ☛ means do not type a return – keep typing to the end of the next line. ␣☛ means type a space, then keep typing to the end of the next line.

One of the most useful features of all AmigaDOS commands is their on-line help facility. It's one of the best help systems around – you can even enter part of a command line and get interactive help on the remainder.

Getting the best from this will come with practice, but first let's look at how the system works. Boot your Workbench disk and open a Shell. Remember that the prompts shown here as "**1>**" are for your information only and must not be entered as part of the command line. Lines printed without a prompt represent AmigaDOS's replies to your entries.

We're going to meet two special characters here: the query – **?** – and, occasionally, the semi-colon – **;**. The semi-colon and everything following it is ignored by AmigaDOS – so I will use it to make occasional margin notes in the code – you do not have to enter them. Try entering this:

```
1>a line of rubbish
a: unknown command
```

AmigaDOS interprets the first word – **a** – as a command, but cannot find it amongst its list of commands, and so generates an error. If, however, we include a semi-colon on the line, everything else is ignored, like this:

```
1>; a line of rubbish
1>
```

Semi-colons are intended for use in AmigaDOS scripts (programs constructed from AmigaDOS commands) to add comments (notes to hep explain what the scripts are doing) to the text and are not usually entered on the command line.

HELP ME OUT

The question-mark is much more widely used. It simply instructs any AmigaDOS command to display its template. Templates will be discussed in a moment. For the time being let's just see what happens. For this example, I'll use a simple command, **ECHO**, which is used to display text in the current Shell window. Here's an example of the command in basic use:

```
1>ECHO "A meagre dos"
A meagre dos
```

Everything delimited by (meaning "enclosed in") quotes is echoed back by the Shell. This command is intended for displaying messages in scripts and for simple string handling. Let's see what happens if we ask it for some help (this example is from AmigaDOS 1.3):

```
1>ECHO ?
,NOLINE/S,FIRST/K,LEN/K:
```

AmigaDOS is in a constant state of flux, so with a later version, say 2.1, you will see something like this.

```
1>ECHO ?
/M,NOLINE/S,FIRST/K/N,LEN/K/N,☛
TO/K:
```

(These commands are almost functionally identical; the extra bits hint at additional features present in the later versions. This sort of thing is only likely to present a problem when you are writing scripts for early machines – but at this stage you should experiment only on your own machine.)

When you try these commands on your machine you will notice that the cursor appears just after the colon at the end of the help text, otherwise known as the template. AmigaDOS is pausing and waiting for you to enter something. This time just press **[Return]** – you'll see something like this (1.3 users will get something similar):

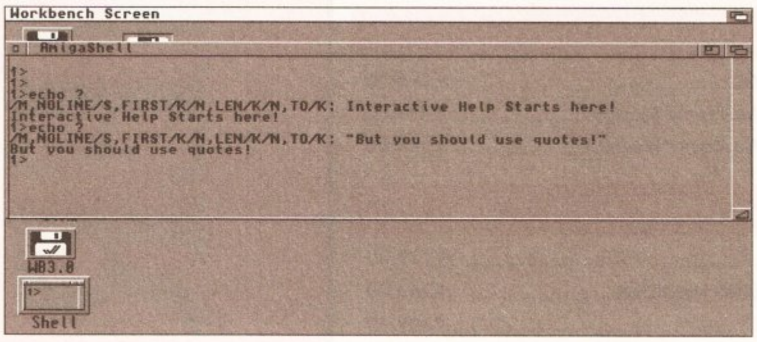
```
1>ECHO ?
/M,NOLINE/S,FIRST/K/N,LEN/K/N,☛
TO/K:
1>
```

In early versions, **ECHO** always prints a "newline" in the Shell window at the end of anything it tries to display (meaning that anything further to be printed will be printed on a new line). When you press **[Return]** the **ECHO** command prints a blank string (In programming we call any group of one or more letters a "string" or "character string") plus a newline. (You can see this effect in AmigaDOS 2 by entering a null string – an empty pair of quotes: "".)

When an AmigaDOS command displays a template it is actually waiting for you to enter something, and for this reason it is said to be in "interactive mode". We can see the interactive mode in action by executing the example again and adding some text to the end of the line:

```
1>ECHO ?
/M,NOLINE/S,FIRST/K/N,LEN/K/N,☛
TO/K: "Hello world"
Hello world
```

Now then, what about all that other



Interactive help is a very useful feature found in all correctly written AmigaDOS commands - just add a "?". It gets better with later versions too.

JARGON BUSTING

ASCII – American Standard Code for Information Interchange. An almost universally accepted standard character (letter) set. ASCII defines one byte per character, where 0–31 are control codes; 32 to 127 are upper and lower case characters; 128 to 255 are application or computer dependent.

Bit – A single item of information capable of being in one of two states – on or off. The smallest item of information used by digital electronic computers.

Byte – Eight binary bits stored in a single addressable location in memory. A single byte can represent (depending on interpretation) a printable character or a number between 0 and 255 or –128 to +127.

Device – A piece of hardware "connected" to AmigaDOS through some software. Every device has a name ending in a colon, such as **DF0:**, **RAM:**, **PRT:**, **PIPE:** and so on.

File – A collection of zero or more bytes written to, read from or stored on a mass-storage device.

Longword – 32 contiguous binary bits or four bytes. Usually used for memory addressing and capable of storing very large numbers in excess of 4 billion.

Nibble – One half of a byte.

String – A collection of bytes, usually (but not necessarily) printable characters.

Word – 16 contiguous binary bits or two bytes. Usually used for numeric values between 0 and 65535 or –32768 to +32767.

AMIGADOS MASTERCLASS

Did you know you can control AmigaDOS remotely from another computer? The software is already fitted and all you have to do is access it! As I write this text on a stand-alone Macintosh computer, the Amiga is running a Shell on a terminal program in the background. All input to that Shell is coming from the Mac keyboard and all output is being sent to the terminal. (The same is not possible in reverse without expensive hardware.)

All you need is another computer with a simple terminal package (an Amiga running *NComm* is ideal) and a serial lead to connect the two together. Use the serial preferences to make sure the two machines agree on protocols and data transfer (say 9600 baud, 8-N-1). Now, on the host machine enter the following command:

```
NEWSHELL AUX:
```

and presto, a new Shell process starts up on the remote machine. All AmigaDOS commands that communicate through the current console window can be used.

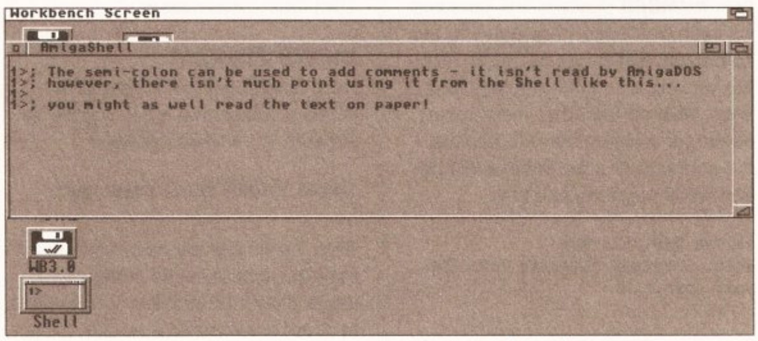
Don't call things like **ED** however – even if you use the current screen, **ED** will still use private AmigaDOS packets to navigate the display.

---

stuff? We can break the template down into its component parts like this:

```
/M
NOLINE/S
FIRST/K/N
LEN/K/N
TO/K
```

Each one of these strange looking things is a place holder for an argument – information you give to the command in order for it to work. Arguments are usually (but not always) followed by an argument type, as listed in Table 1 on page 76. Don't panic if this looks a bit confusing at this stage.



The semi-colon character is used to add remarks to AmigaDOS command lines. It's more useful for scripts than for ordinary command lines, though.

The first of these argument place holders has no name – just a type of multiple (**/M**) in AmigaDOS 2 and higher; in other versions it has no type at all. This argument can accept multiple entries (words) in order to enable you to enter strings of text delimited by spaces – quotes are not necessary. For example the following are valid from AmigaDOS 2:

```
1>ECHO Amiga; a single word
Amiga

1>ECHO Amiga Shopper ▼
Rules; several words
Amiga Shopper Rules

1>ECHO "Testing" "1" "-2-" ▼
"3"; using quotes
Testing 1 -2- 3
```

In versions prior to release 2, you must enclose the entire text with quotes (unless what you're using is just a single word) because the Shell will not read the line correctly and think the extra words are incorrect arguments. Here is the same thing in AmigaDOS 1.3:

```
1>ECHO Amiga; a single word
Amiga

1>ECHO "Amiga Shopper ▼
Rules"; several words
Amiga Shopper Rules

1>ECHO "Testing 1 -2- ▼
3"; using quotes
Testing 1 -2- 3
```

It is interesting to note here that AmigaDOS 2 and higher always inserts a space between the separate multiple arguments. If you need a string to appear in a particular way, you *must* enclose the whole thing in quotes.

Now what about those other arguments? In general the argument name gives some clue as to what it does. Once you have learned the command, it provides at least an aide-memoire to its function.

Arguments followed by **/S** are called switches or switched arguments and are activated by their presence on the command line. **ECHO** has a single switched argument, **NOLINE**, which suppresses the standard newline the command provides. For instance:

```
1>ECHO "No line feeds! " NOLINE
No line feeds!1>; press ▼
<Return now>
```

This option may seem a little odd, but that is only because it has been used in isolation. It is actually intended for use in AmigaDOS script programs where two or more lines are being joined on-screen as a complete sentence. It does, however, neatly demonstrate that AmigaDOS can locate named arguments (usually called keywords) wherever they happen to be on the line. This means you can move a switch such as **NOLINE** to the start of the command thus:

```
1>ECHO NOLINE "Noline at start"
Noline at start1>; You see?
```

Keywords (type=**/K**) are odd ones. They are supplied as part of the command line – like a switch – but also take an argument. Some keywords can accept any characters, others only take numbers (they are of type **/K/N**) and if a non-numeric argument is passed to a numeric keyword, the command will fail. Prior to release 2, numeric arguments were parsed (converted to an internal form) by the commands themselves, so there is a certain degree of extra ambiguity surrounding them. **ECHO** is a typical example – compare the AmigaDOS 1.3 template shown above with the same one taken from a later version.

STRING SLICING

Two keywords are available for **ECHO**: **FIRST**, which defines the first character from the string to be printed; and **LEN**, which states how many characters are to be printed. These options are available in all releases of AmigaDOS covered by this series. Here are a couple of examples:

```
1>ECHO "12345678989" FIRST=2
2345678989
```

You should note that the equals sign between the keyword and its argument is not required, but it does make things clearer to the reader. In the following example the keyword has been repositioned:

```
1>ECHO FIRST 5 "12345678989"
5678989
```

The keyword **FIRST** has a normal range from one to the maximum number of characters in the string. However, there are two special cases:

```
1>ECHO "12345678989" FIRST=0
12345678989

1>ECHO "12345678989" FIRST=255
9
```

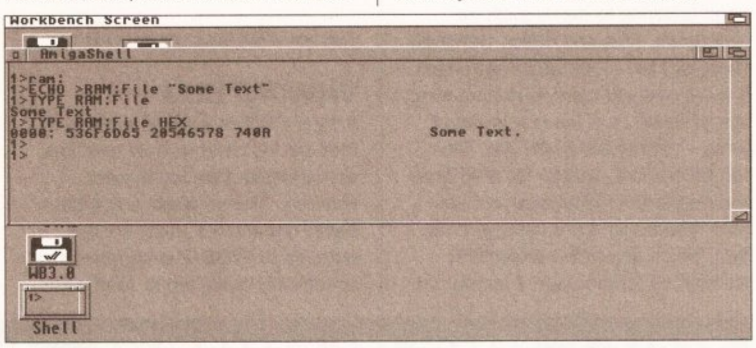
The first example here is not guaranteed to be reliable prior to release 2, but the second one (**FIRST=255**) always prints the last character from the string. This might seem like a waste of time but it can come in remarkably handy, as you will learn if you take the trouble to examine some of Commodore's own script code. (Any number can be used for this purpose, by the way, provided it is greater than the number of characters in the string and less than 256.)

ECHO's other main keyword is **LEN**, which determines how many characters are used, like this:

```
1>ECHO "123456789" LEN=5
56789

1>ECHO "123456789" LEN=2
89
```

LEN counts characters from the back of the string, so only **LEN** number of characters from the end are displayed. This is quite intentional, and can be overridden by combining the keyword with its counterpart, **FIRST** thus:



The TYPE command can be used to view text files and even binary files too. Whether or not you can follow the contents of a binary file is another matter.

```
1>ECHO "123456789" FIRST=3 LEN=5
34567
```

so, **LEN** characters starting from position **FIRST** are displayed.

MULTIPLE ECHOS

Things can get a little confusing

when you attempt string slicing on multiple arguments. This problem is less likely to affect hardened AmigaDOSsers progressing from 1.3 to version 2 and higher because they will be used to surrounding the text in quotes: make sure you get into the habit.

Let's take a simple example – multiple arguments as a single sentence with and without delimiting quotes:

```
1>ECHO "Read Amiga Shopper ▼☛
Monthly" FIRST=7
miga Shopper Monthly

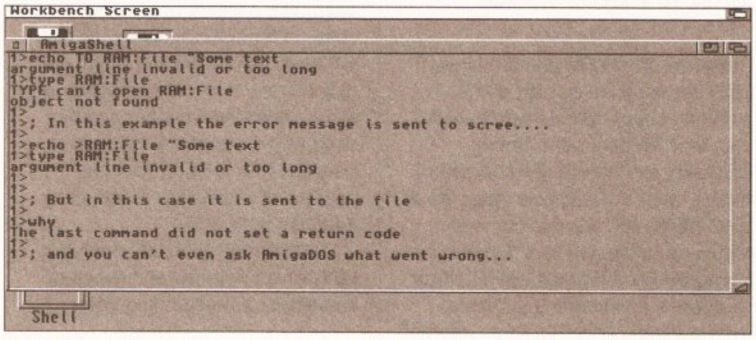
1>ECHO Read Amiga Shopper ▼☛
Monthly FIRST=7
d a r y
```

The effect is not quite the same! This is because **ECHO** is treating the input as a single string in the first instance and four separate ones in the second. If the second effect is what you wanted to do, make sure you enclose each argument in quotes, like this:

```
1>ECHO "Read" "Amiga" ▼☛
"Shopper" "Monthly" FIRST=7
d a r y
```

OBJECTS, AND ALL THAT

AmigaDOS uses the term "object" when referring to items such as directories, files and disks. Generally speaking, the most important object is a file and you need to realise what one of these is. A file is a group of bytes – characters if you like. Files can be created, written to, read from and deleted. Applications you use from Workbench save your work as files, which are called projects in Workbench terminology. Files do not necessarily have to be stored on a disk; when you display a message on screen with **ECHO**, AmigaDOS writes a file to the console device **CON:**.



Using the re-direction operator > is a tricky business at the best of times. It's best to use "TO" if the command and AmigaDOS version supports it.

Typically though, we think of files as things stored on disk, so let's try that. AmigaDOS has a natty little facility which can send the screen output of any command to a named device. This system is called re-direction and the basics are quite simple to use (although more advanced facilities are available).

AmigaDOS can access any disk in two ways: either by its volume name (the one it was formatted with – **Workbench**, **Extras**, **MyDisk** etc.) or by its device name. Device names are shorter and therefore quite convenient, but they can give rise to problems since you might try to access a drive that does not exist or worse, write to the wrong disk altogether.

There is one exception to this rule: the RAM Disk. Since the RAM Disk is only memory based it is impossible to do it any damage, and besides there is only one of them so there can be no mix ups. You should have already referred to your floppy disk drives in file requesters as **DF0:** and **DF1:** (if you have one). The RAM Disk is called simply **RAM:** and we can write a file to it just like this:

```
1>ECHO >RAM:File "Some text"
```

VIEWING FILES

AmigaDOS has several commands that can be used to view text files, and graphics files too in later versions. The smallest and most easily understood utility for this purpose is **TYPE**. The command is specifically designed to read a file (usually from disk) and present it on screen. Essentially, all you have to do is specify the name of the file you want to view (including any disk names and so on). For instance to view the text file created above you would use:

```
1>TYPE RAM:File
Some text
```

As with all things AmigaDOS though, there is more to it than meets the eye, as can be seen from the command's template:

```
1>TYPE ?
FROM/A/M,TO/K,OPT/K,HEX/S,☛
NUMBER/S:
```

This states that the command can accept one or more files to display (at least one **FROM** argument must be supplied) and can take several other options. The **TO** keyword is identical to the one present in **ECHO** described below; and **OPT** is reserved for compatibility with versions prior to AmigaDOS 1.3, so we will not trouble ourselves with it here.

The **HEX** and **NUMBER** options are much more interesting though. They are mutually exclusive switches: you cannot specify both on the same line. **NUMBER** displays line numbers for each line typed (displayed) by the command, which can be useful if you are viewing a text file with very long lines. **HEX** on the other hand is very useful for programmers. It displays the contents of a file in hexadecimal and ASCII notation, like this:

```
1>TYPE RAM:File HEX
0000: 536F6D65 20746578 740A ▼☛
Some text.
```

The first four digits are a hexadecimal number from 0 to FFFF and indicate the position or offset within the file. The next three blocks of numbers (not gobbledygook, honest) are ASCII characters represented as hexadecimal values. At the very right of the display, the 12 bytes are displayed as true ASCII characters; non-printing and control characters are shown as dots.

In this case the following apply for the first four letters:

GOTTA PROBLEM? GET A MODEM

If you have any problem with AmigaDOS and you need an answer fast, all you have to do is drop me a line via the Compulink Information Exchange, CIX (SMIDOID) or join us in the Amiga Shopper conference. See our regular comms column for details of how to get on-line.

```
Decimal     83 111 109 101
Hex         53 6f 6d 65
ASCII       S  o  m  e
```

Confused? Don't worry – hexadecimal is used by programmers because it is easier to understand byte values that way. Each byte is always two digits long and the top and bottom nibbles are at the left and right of the number respectively. You can follow the ASCII values by subtracting 64 from the upper case letters and 96 from the lower case ones. This will give you a number corresponding to that letter's position in the alphabet. For instance: 83–64=19; S = 19th letter. (upper case) and 111–96=15; o = 15th letter (lower case).

MORE ECHO'S

From AmigaDOS 2, you can send **ECHO**'s output to a file using the **TO** keyword – it's used like this:

```
1>ECHO TO=RAM:File "Some text"
```

Okay, so what's the advantage, apart from this last example being slightly longer? Well the problem is when you re-direct a command's output using "**>**" everything it displays is sent to the file – including any error messages. For instance, if we were to include an error, such as missing the last quote off, the line appears to work:

```
1>ECHO >RAM:File "Some text
```

but it doesn't, as we can demonstrate by using the keyword approach:

```
1>ECHO TO=RAM:File "Some text
argument line invalid or too long
```

The error message from the previous version was actually sent to the file, as we can show using **TYPE**:

```
1>TYPE RAM:File
argument line invalid or too long
```

Next month I'll continue with a discussion of the AmigaDOS pattern matching system and its related wildcards. AS

TABLE 1: TEMPLATE REFERENCE – CUT OUT AND KEEP

Template	Name	Meaning
None	Argument	Place holder for an optional argument. Positional keyword not required.
/A	Required	Must be supplied for the command to work. Positional keyword not required.
/F	Final	The last argument on the command line – everything is included. V2+
/K	Keyword	Positional keyword must be entered with its argument.
/M	Multiple	Multiple arguments may be supplied. V2+
/N	Numeric	Argument must be a number. (May be combined with /A and /K.) V2+
/S	Switch	Optional positional argument operational when on command line.
/T	Toggle	Action is toggled. (Supported in ROM but not used.) Intended for resident code V2+

Uncharted depths

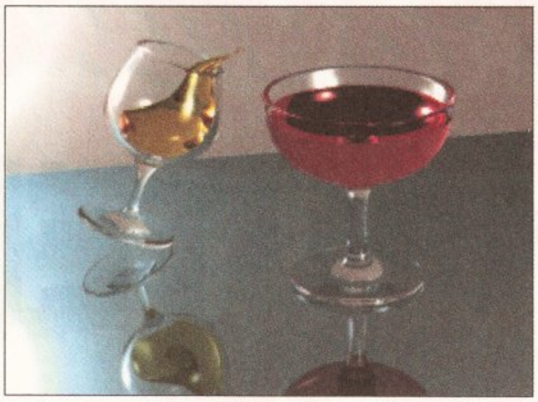
The updated version of RealSoft's Real 3D seems to offer everything – from B-spline modelling to motion blur. Gary Whiteley checks what's missing.

R*eal 3D* v2 is the long-awaited reworking of RealSoft's *Real 3D* modelling and animation software. It is available as an upgrade, but even as you read this some buyers are probably still receiving their copies, apparently delayed thanks to a shortage of English manuals... And it's massive. It will take you *ages* to find out all that it does – I've spent at least three days a week for the last five weeks checking the beast out, and I'm still left scratching my head at parts of it, such is the depth and complexity of the program.

A lot of new features have been added, including "real-world" ones such as gravity, collision detection, skeletons, soft shadows, depth of field and motion blur, plus lots of other goodies: B-spline modelling, meshes and RealSoft's very own programming language, RPL.

Improved flexibility is claimed through the use of user-definable view and tool windows as well as the program's ability to render to many of the graphics cards currently available for the Amiga. Animation techniques in particular are claimed to have been made much easier.

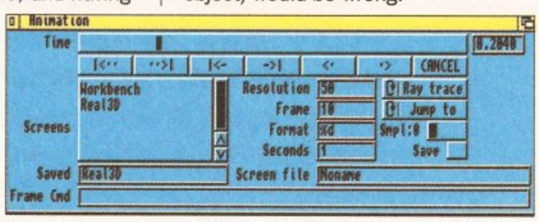
But what does all this mean to the average Amiga user? Probably very little, considering that the minimum configuration for using *Real 3D* v2 is an accelerated Amiga (with at least a 68020 CPU and maths co-processor), at least 3Mb RAM and a hard drive. This is fair enough, since it's a serious piece of software, but the *recommended* configuration includes 5Mb RAM and no less than a 68040 accelerator! My test machine (A2000 with 40MHz 68030, 10Mb RAM, 120Mb HD, OpalVision card) probably represents a happy medium between speed and cost, but there were times when even it couldn't quite keep up...



This image looks great, but it took an epic 13 hours to render the whole thing on a 40MHz 68030 Amiga.

I'd seen some marvellous sample images produced by *Real 3D* v2 and I was itching to have a go myself, but I certainly didn't foresee the huge (and often frustrating) learning curve which was to follow.

Having worked with Amigas since 1986 using programs like *Sculpt 3D*, *Videoscape* and *Imagine*, and having done my fair share of dabbling with *Real 3D*, I was confident that it wouldn't take too long to get up and running with *Real 3D* v2. But even after concerted attempts to crack it, I'm still far from confident in the use of many of *Real 3D* v2's features. I think there are three main reasons for this – the user manual, the program interfaces and the sheer depth of possibilities on offer.



Real 3D v2's new animation control window.

THE MANUAL

Many people would regard a manual as something essential for teaching its owner how to use – and get the best out of – the software. Tutorials, references, hints, tips and clear instructions on the basic principles of the programs are a prerequisite. At first glance this *seems* to be the case with the quite hefty *Real 3D* v2 manual, which is smartly presented and appears to be very thorough. Yet as I started working my way through it I realised that I kept getting lost and confused – and, annoyingly, I couldn't get quite a few of the numerous tutorials to work correctly, no matter how hard I tried. Sometimes the descriptions seemed to assume that you were born with a full knowledge of all the necessary skills to complete increasingly complex projects, and several times I was on the point of giving up in disgust. Even some of the simplest-looking tutorials would flummox me – because small, but important, details like the spelling of a Tag command (a modification instruction for an object) would be wrong.



Even better than the real thing? Motion blurring and soft shadows are just two of the effects offered by Real 3D v2 which help create that "real-world" look.

Even as I write this, I'm still not sure why I can't get the Wine Glass tutorial to work, or several others. And I certainly don't fancy the costs of getting tech support from Holland!

There are plenty of other items which receive very little explanation in the manual – most of them things I really wanted to know about, like spline mapping and soft shadowing, to name but two examples.

But all of this isn't to say that the program doesn't work. In many cases it does, and quite superbly at that, though it often takes a hell of a lot of headbanging and a lot of reference to the manual to get there.

THE INTERFACES

Although RealSoft should be commended for trying to make the program as powerful as possible, the end result is that it is possibly too clever for its own good. Take the case of the interfaces: it is possible to set up how the program displays its information in a wide variety of ways. Windows can be opened and resized for many aspects of the program's operations. As well as the actual viewing window (or windows), the **Selection** and **Tools** windows can be customised and placed anywhere on screen. The trouble is, the **Tools** icons are rather incomprehensible (a pull-out Key card would help), so I found myself resorting to the pull-down menus and using only the few Tool icons I could easily recognise. So most of the fancy environment stuff was straight out of the window, at least as far as I was concerned.

And speaking of pull-down menus – I've never seen so many in one program! Add to that the pop-up menus that also appear for controlling drawing parameters, rendering modes, materials, animation control, and many, many more and you've got more of a maze than a control system. Wading through endless menus is not my idea of fun – especially when they also demand excessive mouse use.

AND FEATURING...

It's just impossible to describe all the features of *Real 3D* v2, so here's a run-down of the most important:

- 24-bit output, with support for many current graphics cards.
- B-Spline and solid modelling.
- Boolean operations.
- Hierarchical Object construction.
- Macro operations.
- Fractal landscape and tree generator.
- Particle animation system, including adjustable gravity, automatic collision detection and reaction, velocity, direction and many other attributes.
- Extensive surface mapping, textures and properties control (now including multiple maps per object).
- Mathematical and procedural textures.
- Motion Blur.
- Soft Shadows.
- Depth Of Field control.
- Alpha Channel Output.
- B-spline texture mapping.
- Inverse Kinematics and skeletal control of objects.

If you thought *Imagine* or *Aladdin 4D* was hard to get to grips with, you ain't seen nothing yet.

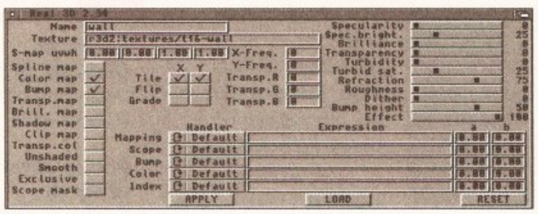
THE FEATURES

But what of the powerful rendering and animation features, the power of B-Spline and Mesh modelling, the easy visualisation and the speed that we've heard so much about?

B-Splines are brilliant for making very smooth-surfaced objects. They also take ages to render, especially if they have any kind of transparency properties. As an example, I test-rendered the supplied demo scene of two glasses. These are B-spline objects with "liquids" inside them and a few other tricks like a graduated background and reflective table surface. At a rendered size of 736 x 576 pixels a 24-bit image took almost 13 hours to render on my Amiga, even with shadowing turned off! I'm glad I wasn't animating it.

Fair enough, maybe I should have been using an '040 machine to do something so serious, but when I constructed a similar scene in *Imagine 2* it took only three hours. Okay, it didn't look quite as realistic as the *Real 3D* v2 one, particularly since *Imagine* doesn't use B-splines, and the glasses were more "lumpy" as a result, but it was ten hours less – which is something I can live with.

Incidentally, I'm told by those "in the know" about *Real 3D* that there's little need for using B-splines on such objects, because they can also be made by lathing compound objects. Such objects also take a lot less time to render.



Here's where a new material is dreamed up.

But what else is new? In one fell swoop *Real 3D's* animation system has been dramatically changed from a very simple, frame-by-frame set-up to a very flexible, almost infinitely controllable system based on key-frames and paths – with a lot more besides. As well as being able to use simple spline paths to control where objects move, you get so many other functions that it almost beggars description. And they can all be used in tandem, or in hierarchical levels to enable spectacular effects like collision detection, skeletal movements, gravity and many others to be produced reasonably easily. The trouble is (here we go again) that the once-perfect camera-tracking of objects no longer works in *Real 3D* v2, and finding a way around it is a real pain.

BREATHTAKING

But for me the most breathtaking aspect of *Real 3D* v2 has got to be its Particle Animation System. Imagine being able to give an object real physical properties, like mass, velocity and rotation, and then make frictional, gravitational and other forces act upon it. Set a few of these objects in motion. The result: the nearest thing to realistic actions and reactions that the Amiga's yet seen.

By combining Particle Systems with more conventional animation tools, it is possible to create some extremely interesting results. Colliding objects are relatively straightforward and will have you fascinated as you watch how one object can hit another, spin off into a third, and so on. But that's just the tip of the iceberg.

With Methods (these are the different properties that affect objects) and Tags (which define parameters like mass and friction) you can produce some very complex environments. Wind effects, gravitational attraction, skeletal control, object duplication and morphing, wave functions, friction, and more effects are all available.

If only the tutorials about this spectacular subject were better written I would really be enjoying myself now, instead of having to recover from a terrific slog through a series of confusing instructions which were sometimes correct, sometimes not. Overall the gain was just greater than the pain, but it was a close-run thing!



"Heck, those Real 3D v2 B-splines sure are smooth. Real smooth. But unfortunately for us folks with slow Amigas, they also ain't too quick on the draw."

GEE, MR TRACEY

Then there's Inverse Kinematics. What exactly is it? And why is it useful? It's a bit like Thunderbirds really – well, at least as far as pulling the strings on Scott and Virgil goes. Inverse Kinematics lets you produce hierarchical movements which can be as simple as moving a skeleton attached to one or more objects.

Take the example of a finger, which has a skeletal structure of jointed bones. By providing a similar structure in the program, *Real 3D* v2 can quite easily simulate its movement. If "flesh" is moulded over the "bones" and an Inverse Kinematic method is used you can get the whole finger to flex by just moving its tip. Almost a case of the tail wagging the dog.

Logically this method can be applied to complex moving objects, whether organic or mechanical – great for robot arms and walking figures. However, while a wireframe preview works fine, a ray-trace render appears not to happen – everything seems stuck. Yet behind the scenes the images are being rendered. It looks like a bug to me.

VISUAL TRICKERY

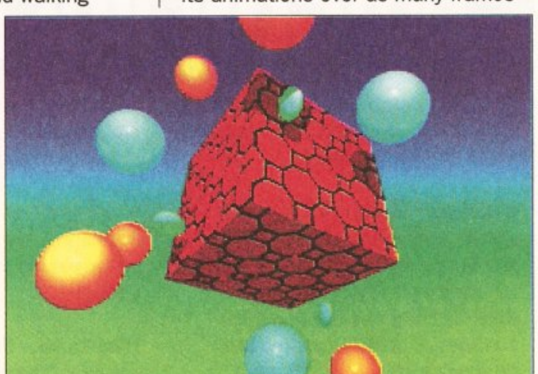
As well as the usual hard-edged type of shadows, *Real 3D* v2 now offers light sources which can produce much more realistic-looking "soft" shadows. The trade-off for such realism is, inevitably, a further increase in rendering time.

Another nice visual trick is Depth Of Field, an effect associated with lenses and distance. *Real 3D* v2 emulates this effect, making a scene appear progressively more blurry with depth while keeping the foreground objects in sharp focus.

Talking of blurring, a much sought-after (and currently en vogue) computer graphics trick is to use motion blurring to give an enhanced impression of speed to a moving object. While this works fine, as in the sample picture, it once again adds to rendering time. It's great for stills, but probably excessive for all but the most fanatical of ray-tracers or the most critical of jobs.

ANIMATION

Real 3D v2 has a new Animation Control window where you choose settings such as the number of frames. Unlike many other 3D programs, *Real 3D* v2 interpolates its animations over as many frames

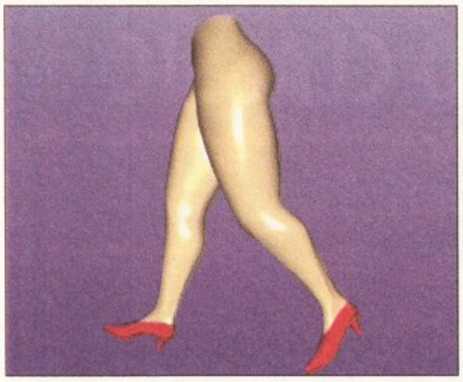


With Real 3D v2's "gravity" feature you can build your own weird universes, like this one by occasional Amiga Shopper cover artist, Henri Bujko of Alternative Image.

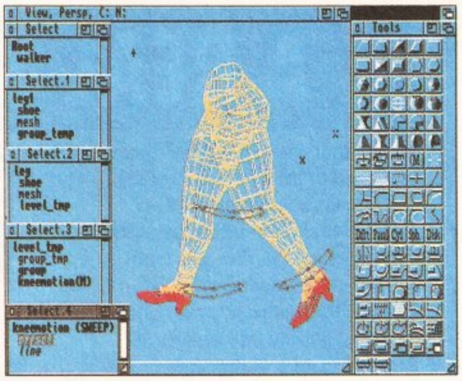
A REAL 3D CLASSIC



Now that *Real 3D* v2 has been released, the original *Real 3D* 1.4 has been renamed *Real 3D Classic* and cut to just £99. It may lack the raw and total power of its successor, but *Real 3D Classic* is a very good way of getting into quality 3D graphics at a surprisingly reasonable cost. In fact, the only other sensible choice is Impulse's *Imagine 2.0* – at least in this price bracket. To whet your appetite the picture here shows what an experienced *Real 3D* user (Henri Bujko of Alternative Image) can produce. Just don't ask us how long this one took to render, that's all!



These legs were made for walking. And, just as in the famous song, walking is what they do.



Real 3D v2 at work – selection windows, tools on the right, and a view window in the centre.

as the user chooses, automatically adjusting the motion of the various component objects to take account of any changes in length.

Unfortunately, there is no easy way of stopping part way through a render and then starting it up again at a later date. Partly this is due to the nature of the Methods used – which is understandable. But the simple addition of a requester asking "Which frame do you want to continue rendering from?" would save all the trouble of having to step through the animation in wireframe every time. This could be very tedious and time-consuming with animations of any length, although long scenes could always be subdivided, I suppose.

RPL

Real 3D v2's other major innovation – if that's the right word – is RPL (Real 3D Programming Language) which appears to have been specially devised for those with a manic propensity for mathematical perversions. Not only does it incorporate that most hideous of calculating systems, Reverse Polish Notation, where doing something as simple as **2*3+5** requires an input of **'2 3 * 5+.'**, but it also requires an extensive knowledge of complex mathematical formulae in order to cause wild and wacky things to happen. A few simple point-and-click choices for favourites like rippling water and moving particles might have helped, but instead we are asked to enter cabalistic text like:

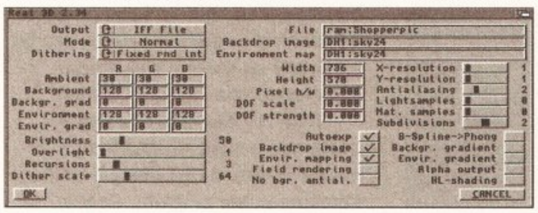
```
0 SWAP vTMP V@ 0 M_MOVECOG
```

If you have a Masters in maths this might all be fine and dandy – but most people will find it completely out of order. So get real, RealSoft, and make it easier for mere mortals to get to grips with RPL.

THE VERDICT

I have to admit that I have not been able to look into every last aspect of *Real 3D* v2 – it is so huge and complex that it could easily become someone's life's work to explore it all. But two points stand out.

The first is that *Real 3D* v2 is not the blisteringly fast program it is claimed to be, particularly when rendering B-Spline objects, soft shadows or motion blurs, and even with '040-equipped Amigas.



And this is where the rendering settings are defined.

The second point is that *Real 3D* v2 is very difficult to get to grips with – especially if you want to do anything serious – mainly because the manual is very poorly written and lacking in essential details. So much so, that there seems to be very little point in the software being dongle-protected: the manual and interfaces quite adequately perform the same function on their own. But once you've spent a couple of months locked in a padded cell with your Amiga and *Real 3D* v2 you should start to get the hang of it.

However, there are many positive aspects too. *Real 3D* v2 has tremendous potential for extremely exciting uses, not least because of the way it can be programmed to use real-world Method and Tagging features like collision detection and gravity. You're then left free to get on with the creative business and let the software handle the tricky stuff.

And while *Real 3D* v2's rendering may not be the fastest around, you should consider just how long it would take to recreate the program's unique features in any other current Amiga 3D software. Then the slower rendering times become far less relevant. For instance, I can't imagine even trying to construct the type of animations that *Real 3D* v2's collision functions make possible with any other piece of Amiga 3D software!

The version I tested did have a few teething problems, but an upgraded version (v2.34) of the program has just arrived which I'm glad to say seems to have fixed many of the bugs I'd experienced. Freeform mesh rotation now works consistently, and multitasking is much more stable.

Real 3D v2 provides excellent quality output, particularly in 24-bit, and its anti-aliasing is possibly the best on the Amiga.

RealSoft have tried to make *Real 3D* v2 the most flexible 3D modelling and animation software around. They haven't quite succeeded – yet. But once they've shaken out all the bugs and have a manual which deserves its name, then I can see the program really starting to make a serious impact. Until then, I have to say that *Real 3D* v2 is a wolf dressed up in sheep's clothing: on the inside it has plenty of muscle and bite, but the documentation and interface which comprise its woolly exterior are far too ovine for my liking.

Rest assured that now other Amiga 3D programmers have seen *Real 3D* v2 there's going to be another small revolution in the way Amiga 3D'ers do things. But will it be RealSoft who reap the benefits? I'd like to think so, but there's still some hard work to be done first. So while you're at it, lads, how about adding elasticity, explode/shatter effects and flowing objects?

Requirements: Amiga equipped with 68020 processor (minimum) and maths co-processor, at least 3Mb RAM (5Mb-plus recommended), hard drive with at least 6Mb free. 24-bit display card also recommended.

• Thanks to Jacek Artymiak of Leeds for lending me his copy of *Real 3D* v2 for in-depth testing. AS

SHOPPING LIST

Real 3D v2 ....£469
From: Alternative Image, 6 Lothair Road, Aylestone, Leicester, LE2 7QB.
☎ 0533 440041.
• Upgrades from *Real3D* are only available direct from Activa – for 569 Deutschemarks.
• *Real 3D Classic* £99 (formerly *Real 3D* 1.4) is also available from Alternative Image.

CHECKOUT Real 3D v2

Features
●●●●●●●●●○
Where's the kitchen sink? It looks like almost everything else is there!

Documentation
●●●○○○○○○○
Peppered with flawed tutorials (as well as many good ones) and thin on real explanations, the manual is a let-down.

Ease of Use
●●●●●●○○○○
Let's face it, there are *no* Amiga 3D programs that are supremely easy to use. Full marks for to RealSoft for trying to make 3D work easier, even if they haven't (quite) yet succeeded.

Quality of results
●●●●●●●●●●
24-bit rendering quality is excellent, which is what really counts.

Value for Money
●●●●●●○○○○
If the program access and manual were better, the price would be fairer. As it is, I think it's maybe £100 overpriced.

Overall rating
●●●●●●●●○○
Deep inside *Real 3D* v2 is a tremendously powerful program trying to get out. On the occasions that it does emerge it is very impressive, but until it is made more user-friendly it will remain a much-hyped but under-used product. I really hope that it can get better.

JARGON BUSTING

Boolean operations – Where one object is used to add to or remove a part of another one.

B-Splines – Mathematical curves which can be used to make very smooth-surfaced 3D objects. Different from Phong shading, which is used to smooth out the surfaces of objects constructed from polygons.

Ray-tracing – A rendering method which computes an image by following the way light travels around a scene from the observer's point of view. Can produce very realistic images.

Rendering – Any method which generates an image from a 3D scene.

Wire-frame – Using a thin outline to represent the edges of an object, instead of rendering it as a solid. Usually used as a way of speeding up modelling or animation layouts.

Getting things into perspective

Wilf Rees introduces some basic principles to help you produce professional-looking pictures, then reviews Play and Learn from Playwise Software.

With such a sophisticated machine as an Amiga, it is easy to produce really professional-looking images – but even easier to produce something with a lot of surface gloss that will never look right because the basic principles are all wrong. You may have been introduced to these in art classes at school, but, as is often the case, these fall by the wayside as you attempt to achieve fast results. However, sticking to the rules will help you to improve the overall quality and accuracy of your images. So let's look at the basics of construction and composition. Think of the analogy of building a house. Fancy brickwork and decorative mouldings are all very well, but if the foundations are not solidly built, then the house will fall down. Follow these few simple rules and guidelines, and you will find your pictures improve no end.

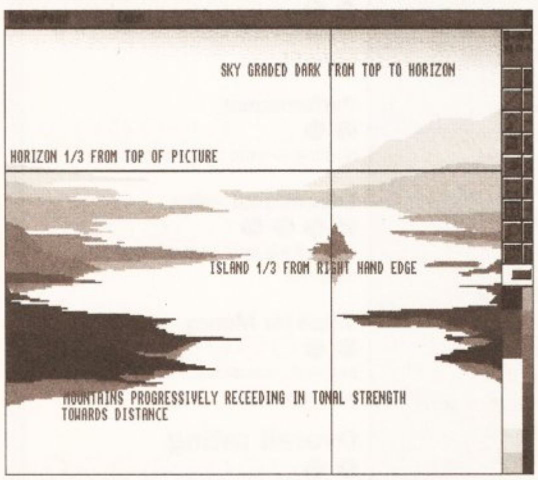
Old Masters, whose gallant efforts adorn the walls of many a gallery, evolved a scientific principle for dividing up a space. This system essentially works on the basis of thirds. It's tempting for beginners to place the principal visual feature smack in the middle of the screen. However, the Old Masters found that compositions looked more harmonious and pleasing if features of interest were off to one side, dividing the space into thirds rather than into halves. This principle applies both horizontally and vertically. Consider the example Fjord landscape below, rapidly produced on *DPaint*. I have emphasised the thirds rule, by first placing the horizon one third down from the top, and to balance that, sticking a small island one-third in from the right.

The Fjord picture illustrates another important phenomenon. Remember those far-off days when people used to smoke in cinemas? Well, if you peered up into the light from the projector, you could see all of the filth and dust in the air, highlighted by the strong beam of light. Outside in the atmosphere, the same dust exists, as you'll notice when a strong ray of sunlight shines into a shadowed area. All these tiny particles in the air act like a visual filter, leaching out the intensity of colour as distance increases. Test this by looking at the colour of the foliage on a nearby tree, then at foliage in the distance.

This principle has been used for centuries by artists to create the illusion of distance. Contemporary Japanese graphic artists have developed this technique into something of a specialised art form, and in the Fjord picture I have tried to demonstrate this by creating a grey-scale of 12 shades and gradually lightening the layers of mountains as they move into the distance. Similarly, by using that same grey-scale and filling the sky from top to bottom, becoming lighter towards the horizon, a further illusion of distance can be created.

DISAPPEARING DISTANCE

The third key principle (and the most widely abused) is that of perspective. The concept is really quite simple, and *DPaint* has some marvellous features for speeding up the whole process, including a very handy built-in perspective feature. However, just relying on an automatic system can mean you misuse it – it helps to understand the theory as well.

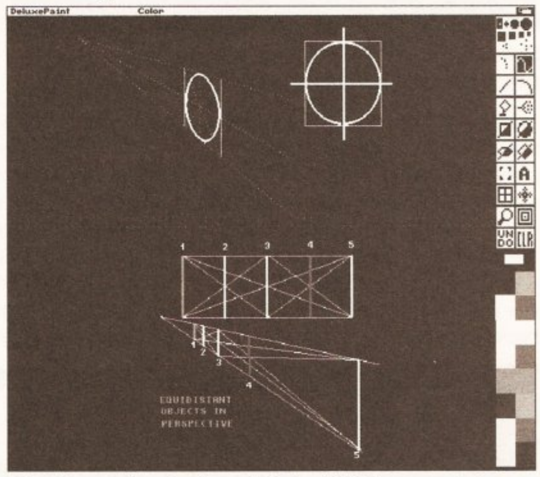


It may not quite be an Old Master, but this Fjord picture perfectly illustrates the principle of thirds.

There are two main systems of perspective: one-point and two-point. In the illustrations you can see how the two systems differ, but the principles of both are the same:
1. All vertical lines remain vertical.
2. All other lines converge to the vanishing point.

In the example shown here, I have emphasised the convergent lines which go to making this two-point rendering. As you can see, drawing a basic shape is much more accurate if you follow the principles of perspective, and it's easier too. The alternative, one-point perspective, is usually more suited to interiors.

Two aspects of perspective drawing which continually cause problems are receding objects and producing circles in the right perspective.

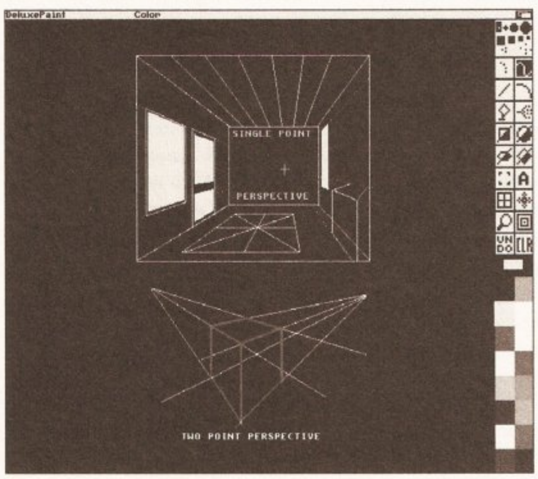


Whether you're dealing with straight lines or circles, the same geometrical principles will always apply.

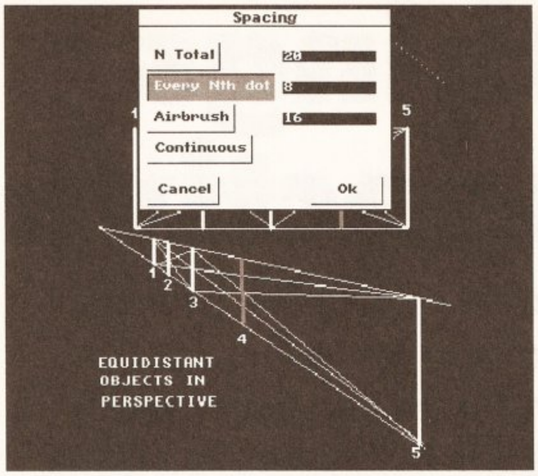
A classic example of receding objects is telegraph poles. In the example above right, the poles are viewed as if an observer was looking directly at them from the side. From this view, they are equally spaced, and the construction of diagonal lines from the top and bottom of each of the two end poles gives the position of the middle pole where these lines intersect. The smaller rectangles thus generated can be further divided by diagonals to produce the intermediate positions of the rest of the poles. *DPaint* will do this very effectively using the straight line tool, and if you press the right mouse button while pointing at the icon, you can select "**EVERY NTH**", which provides a selectable dotted line, most appropriate for your construction lines.

When one views the telegraph poles in a perspective point of view, the distances between the poles reduce, as does their relative height. However, the point to remember is that the same rules apply. Again, you must use the first and last poles as if they were the sides of a rectangle, and find the intermediate poles by constructing the diagonals (see the picture on the next page).

As for circles in perspective: if you actually look at one – a car wheel in a photograph, say – you'll see that it is an ellipse. It is possible to use the ellipse tool on *DPaint's* drawing tool menu to construct ellipses representing wheels or circles in perspective, but these are not really accurate, and the best way is to draw a box in perspective, into which your ellipse will fit. In the example shown above is a circle surrounded by a square. The circle touches the square at four points, represented by the two axes. In the box created in



You see, it all depends on your point of view: use one-point perspective for interiors, two-point for outside.



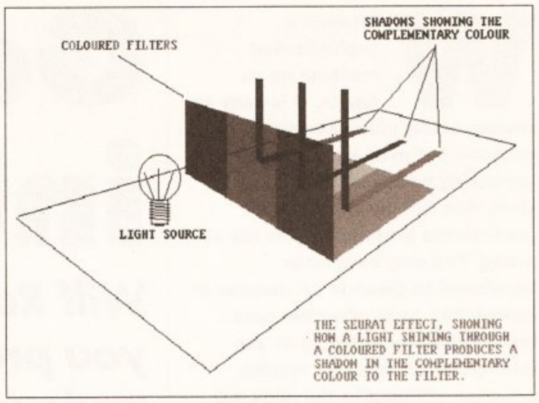
Selecting "EVERY NTH" pixel in DPaint gives you a handy dotted line, ideal for perspective guides.

perspective, the ellipse must also touch the box at the four axial points, and these again can be calculated by drawing the diagonals of the box, then a vertical through the intersection to determine the upper and lower points, and then a line going through the intersection back to the vanishing point to determine the left and right points. These four points can then be joined using the curve tool in *DPaint*.

SHEDDING LIGHT ON THE SUBJECT

The final principle to mention is that of light. Once you have drawn the outline image of your picture, make a conscious decision about a light source. Where the light is coming from is the characteristic which defines a three-dimensional form, and your picture should reflect how shade and brightness are affected by highlight and shadow. With objects which have spherical or cylindrical surfaces, the fill options in *DPaint* offer superb facilities for representing form affected by light direction. You should experiment with different degrees of density of contrast between light and dark to affect mood or atmosphere, relevant to your picture.

It is again good practice to look at how famous artists have tackled the effects of light, particularly Seurat. He used a technique of painting with dots, not far removed from the process your monitor employs to create images. He did however use a very precise scientific technique, which you can also employ. In the illustration of a light shining through three different coloured filters, I have demonstrated how the shadow thrown by an object appears in the complementary colour to the filter – red filter, green shadow; but blue filter, orange shadow. What Seurat did was to employ this effect, by painting tiny dots of the complementary colour onto a shaded background. So on grass, for example, where a dark green shadow exists, tiny dots of red in the shadow can greatly enhance the quality of the image. You can do the same in *DPaint* by opening the palette mixer and generating the appropriate colour, then using the spray gun with a very thin dispersion to add occasional tint. AS

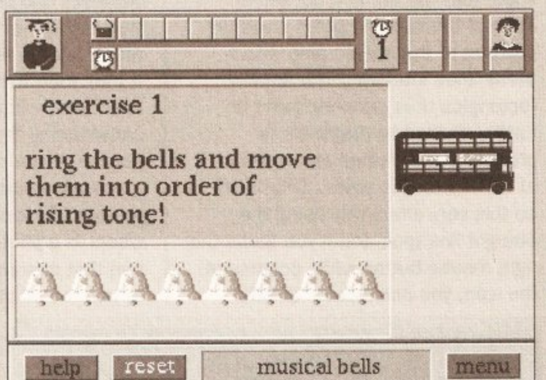


For those of you watching in black-and-white, we're afraid you'll have to take our word for it on this one.

PLAY AND LEARN, OR NOT

These two packages are aimed at the 3 to 8 year old age group, and have similar loading screens. The principles addressed in both of these packages are those of moving, matching, comparing, counting and contrasting differing elements to provide a broad range of assorted experiences for children in this age band.

Play and Learn: Sensorial offers a range of activities from a picture-driven menu. The first I tried involved dropping differing size weights into a rack, in descending size order, with four further degrees of complexity. I did not find the sprite movement particularly smooth or easy to grasp, and while the producers, Playwise, say that children would experience only initial difficulty in handling and placing the sprites in the right places, I would beg to differ: some of the handling required is far too complex for children of that age group.



A screen from Play and Learn: Sensorial, where the child has to rearrange the bells into ascending order of pitch. I found that moving the bells around was clumsy and confusing, while the second stage was simply a reverse of this task. This might be entertaining to a three year old, but is it of any educational value?

The next element I looked at on the *Sensorial* disk was a collection of bells, each ascribed a particular tone. These bells are randomly mixed, and the child is expected to sort them in ascending order of pitch. Ringing is achieved by mouse and button movement, as is moving of the bells into order. Subsequent stages involved the reverse of this process, and more permutations of this pattern. Two further sections on this disk addressed comparative sizes of circles and length of rods. A timer records all of the sections, and pictorial prizes are awarded dependent on the time taken to complete each section.

Mathematics is very similar in structure to *Sensorial*, sharing the same loading screen, initial sounds and structure. The exercises (five on each disk) are essentially concerned with number and fractions, and again I felt the movement of sprites was clumsy. The exercises are not sufficiently self-explanatory, and will, I am sure, present difficulty for a child of the targeted age trying to understand what has to be done.

On a more specific level, Playwise say in their literature, "There is much decision-making and moments of concentration for the child, which can help in the formation of character and assertion of independence." This is rhetorical rubbish. If this was really their intention, they might have given a great deal more thought to the diversity of the exercises included on these two disks. Some of the proposed tasks are really inappropriate for children of the intended age, on a computer, and would prove considerably more beneficial physically done with the objects in question. I wonder if Playwise have any real knowledge of how children learn, or have any experience of packages like *ADI Junior*, reviewed in *Amiga Shopper* 26. (If you missed it, turn to page 116.) *ADI Junior* is in a different league – no, a different planet.

Playwise have not really stretched the Amiga's capabilities, nor have they come up with a package with offers anything of great value to a parent considering a purchase to assist their child in grasping mathematical or relationship concepts.

SHOPPING LIST

Play and Learn Mathematics £29.95
Play and Learn Sensorial £29.95
From: Playwise Software
☎ 0628 666631

CHECKOUT
PLAY AND LEARN

Features
●●○○○○○○○○
All a little too similar, and the sprite movement is clumsy.

Ease of Use
●●○○○○○○○○
Certainly too difficult if you are 3 to 8 years old.

Performance
●●○○○○○○○○
Nothing to write home about.

Educational value
●●●●○○○○○○
Thin educational content, and repetitive.

Value for Money
●●○○○○○○○○
Seriously overpriced. I'm not sure they are serious!

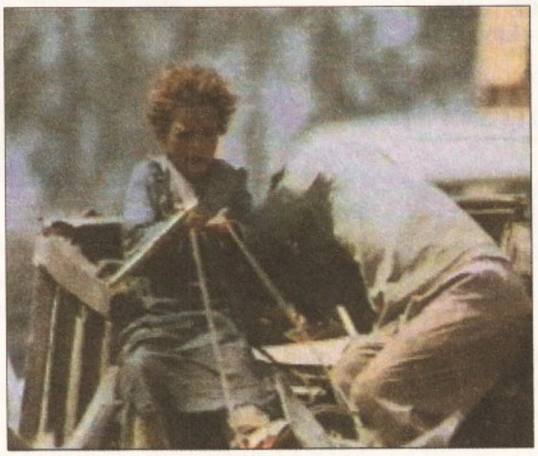
Overall rating
●●○○○○○○○○
Save your money.

How does this grab you?

FrameMachine is another real-time digitiser from Germany. Gary Whiteley investigates whether it really has what it takes to put you in the picture.

Recently I had heard tell of a new card, called the FrameMachine, which could "mix, edit, genlock, digitise, zoom and create", with all the features that OpalVision kept promising. I just had to get hold of one. Of course, what finally arrived was a different kettle of fish: the FrameMachine card itself, a couple of disks, the (optional) FM-Prism 24 24-bit display module and a manual. And no claims that it was anything but a digitiser, sequence editor and glorified screen display.

Like MacroSystem's VLabYC, the FrameMachine card fits into any Amiga with a vacant Zorro slot, it has both YC and composite inputs, and it can grab in real time. It also has a preview mode, so you can see what you're grabbing. But FrameMachine incorporates a much friendlier user interface than VLab for manipulating captured sequences of images. Plus, with the FM-Prism 24 card installed, incoming video can be displayed in full colour directly on any standard Amiga RGB monitor, either in full-screen overscan or as an adjustable, scaled, picture-in-picture display, so you can watch TV while you work.



Here's a 720 x 570 pixel 24-bit grab taken from Powqaatsi, grabbed in real time from VHS videotape.

Installation is straightforward, though hooking the FM-Prism 24 up to an Amiga 2000 is a little more tricky, because a jumper lead is needed which has to piggy-back the Denise chip. This involves removing the power supply, pulling the chip, plugging in the supplied flying lead and re-installing both chip and PSU – hardly a job for a technical wallflower.

So what does it all do? In its basic form the FrameMachine card is a high-speed real-time "fast-scan" digitiser, capable of grabbing images in a variety of sizes and resolutions instantly, directly from video, and storing them into memory or to a hard drive. In this respect it functions significantly faster than the VLabYC. However, grabbing large numbers of frames (or large images) requires substantial memory and hard disk space, and only an accelerated Amiga is capable of anything near 25 frame per second grab speed. You can preview incoming video in black and white and trigger the grabbing when you find a suitable frame. A grabbed image can be displayed in any resolution your Amiga is capable of (including AGA modes) or converted and saved in a variety of formats – including all current IFF flavours, YUVN and 24-bit. As in VLabYC, conversions take some time and FrameMachine cannot grab uninterrupted sequences of full-size images directly, though VLabYC now has the edge with its new sequence controller software.

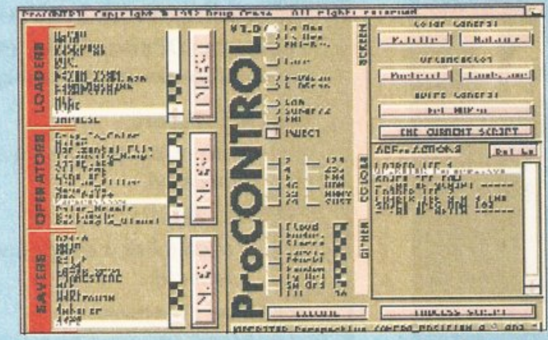
A set of frames can be shuffled around, pruned or repeated to taste; you can even see a mini-view of your new film-clip. Frames can be

TAKE CONTROL

If you're an *Art Department Professional* or *Morph Plus* user who would like to do more in the way of batch processing but don't have the time or inclination to write ARexx scripts, *ProControl* may be for you.

It's not the first such program – that honour went to the now-out-of-date *MacroMaker* a couple of years ago – and it's not the only one – MacroSystem's forthcoming *MultiFrame* sounds very similar – but it is up-to-date and it is available now.

So what is it? *ProControl* is a point-and-click front-end for *ADPro* and *Morph Plus* which enables you to define complex batch-processing operations by simply pressing a few buttons to produce a control script which will then drive these programs and control all the necessary image-crunching for you. For instance, you might want to convert a whole batch of IFF24 files into JPEG ones for more efficient storage, or do something more complicated like use *Morph Plus's* Perspective operator to make a DVE-type fly-off sequence to overlay over another background. In fact, virtually anything that can be done with either program can be controlled from *ProControl*.



With ProControl you can even run multiple scripts one after another. The first script here produces a set of perspective fly-offs of one image on a black background and the second script takes these images and composites them onto a background image.

HOW DOES IT WORK?

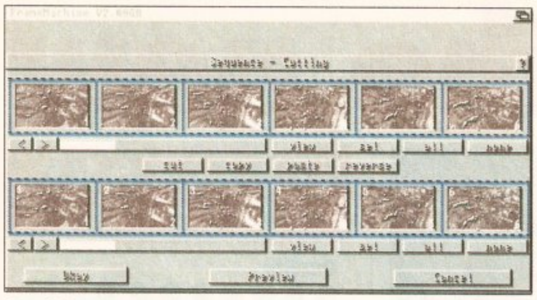
Let's take the example of *ADPro* – though everything applies equally to *Morph Plus*. Loading *ProControl* also causes *ADPro* to load, so you'd better have enough memory available to run both at once – which means at least 4Mb of RAM for serious work. A hard drive and accelerated Amiga help too.

Then you just decide what effects or processes you want to run and set up a script to do it using the buttons and names on *ProControl's* interface – not vital for simple processing jobs, but great for complicated processes requiring multiple-frame control.

First select your input file or files. Choosing a batch of files is simple – no having to type in lists of names. Any **Loaders** you have available in *ADPro* will be available to *ProControl* (as will any **Operators** and **Savers**).

Next you can define which of *ADPro's* operators will be applied to the chosen image or images – anything *ADPro* can do, *ProControl* can control. Multiple operators can be set up to act in turn upon the images being processed. Then you choose





It might not look inspiring, but this is FrameMachine's powerful yet still manageable sequence editing screen.

converted into any supported display format for use with other programs, such as *Deluxe Paint*, though the lack of a palette locking function could lead to some problems here.

As well as colour controls for adjusting the incoming video and a "Special Effects" mode (which false-colours the video) FrameMachine boasts full ARexx support, so it could be useful as part of an automated grab/convert/output system.

FM-PRISM 24

Another advantage of having an FM-Prism 24 card attached is that any grabs can be directed straight to the card for sparkling 24-bit display. It can also be configured to show scaled video directly in a special movable and scalable window on a standard Amiga monitor. Okay, GVP's IV24 was doing this picture-in-picture stunt several years ago, but not as neatly as FrameMachine now does it.

FM-Prism 24 comes supplied with **Loaders** and **Savers** for use with ASDG's *Art Department Professional*, enabling you to display 24-bit and other images directly on the FM-Prism 24. Apart from still images, 24-bit animations can also be played back, at up to 25 frames per second (in quarter-screen size on a suitably equipped 68030 Amiga or better). The FM-Prism 24 card is also capable of several "keying" styles (to determine how the Amiga, 24-bit and video images overlay each other) and of providing a genlocked output from its dedicated RGB port, allowing two video signals to be mixed when a suitable genlock is connected – as well as having graphics overlaid.

But there is currently no paint software which will work directly on FM-Prism 24, and there are no 3D programs that can render to it. So beyond being a fairly flexible display device, FM-Prism 24 still seems like an expensive option at the moment.

I've read that a video mixing / time-base corrector module will become available for FrameMachine. But like everything Amiga, there's no point in pinning your hopes on it, as some did when Centaur announced their video modules for OpalVision. When it's on sale then you know it's available. Until then, get FrameMachine if it does what you want here and now.

CHECKOUT FrameMachine

Quality of results
●●●●●●●●○○
Very impressive, though grabs are sometimes a little on the "soft" side.

Documentation
●●●●●●○○○○
Appears thorough, but is actually far too vague for comfort in some areas.

Ease of Use
●●●●●●○○○○
The grabbing software isn't the best I've seen, but the sequence editing side is pretty good.

Value for Money
●●●●●●○○○○
A little overpriced, compared with its VLabYC rival.

Overall rating
●●●●●●●○○○
Still room for improvement, considering the not-overly-friendly software and the occasional image quality problems.

SHOPPING LIST

FrameMachine £379.95
FrameMachine with FM-Prism 24 ....£664.95
FM-Prism 24 (if bought separately) £329.95
From: Micro-PACE UK Ltd, Unit 10, Perth Trading Estate, Perth Avenue, Slough SL1 4XX, Berks.
☎ 0753 551888.

CHECKOUT FM-Prism 24

Quality
●●●●●●●●○○
As good as most 24-bit cards.

Ease of Use
●●●●●●○○○○
Not too difficult, but selecting display and keying modes could be easier.

Value for Money
●●●●●●○○○○
Too much for not enough.

Overall rating
●●●●●●○○○○
FrameMachine's stumbling block. Not enough features, no paint software, too pricey, yet still almost essential with FrameMachine if you don't already have a display card and need 24-bit video.

what format to save the files in, choosing from the list of **Savers**. If you want each processed image saved in 32-colour lo-res with dithering and a locked palette, or made into an animation, all you need is the right version of either *ADPro* or *Morph Plus*. Then just activate the script and away it goes.

But it gets better. *ProControl* can composite images together – for instance, a whole batch of grabs could be scaled, have white rectangular borders added and be placed frame by frame over a specified background – or it can be used to incrementally control such processes as *Morph Plus*'s **Ripple, Twirl** or **Perspective** operators over time, producing results which can then be animated for dramatic effect.

Making this happen is just a matter of telling *ProControl* how many "frames" to carry out a process over, what the start and end parameters for the operation are, and then letting the software get on with it. Any script changes you might want can be made directly on screen, becoming effective the next time the script is run. And every *ProControl* script can be saved for later recall.

THE SCRIPTS

Unlike ARexx scripts, which require a lot of extra programming beyond the actual control data, *ProControl* produces very terse scripts, though they aren't in an ARexx format – a possible drawback if you might wish to build and modify your own ARexx scripts. In fact, the full details of the batch-processing operation you have defined aren't shown in *ProControl's* scripts, which can be loaded into a text processor for any editing you may consider necessary. But if you wanted total control over scripting you'd do better with ARexx anyway. After all, *ProControl* is for those who have better things to do with our time than crank out ARexx scripts.

I only came across one significant problem – when decompressing JPEG files, *ProControl* doesn't have the option of turning smoothing on, unlike both *ADPro* and *Morph Plus*, which might mean that your incoming JPEGs become that bit more "blocky" than usual. Otherwise *ProControl* is an excellent program which will be a real saviour to hard-pressed image-processing users everywhere.

SHOPPING LIST

ProControl £69.95
By: ASDG
From: Meridian Software Distribution,
☎ 081 543 3500.
or Micro-PACE UK Ltd,
☎ 0753 551888

With ProControl and Morph Plus's Perspective operator, making DVE-style fly-offs – like the sequence below – is a piece of cake.







CHECKOUT ProControl

Speed
●●●●●●●●○○
It doesn't make *ADPro* process any faster, but *ProControl* does help you get on with the rest of your life, which has to be good.

Documentation
●●●●●●●●○○
Not too fat, but contains everything you need to know.

Ease of Use
●●●●●●●●○○
ProControl's fairly easy-to-use interface takes only a little while to get comfortable with; after that it's pretty much plain sailing.

Value for Money
●●●●●○○○○○
Only useful to users of ASDG programs, who again seem to be paying through the nose for solutions to problems not of their making.

Overall rating
●●●●●●●○○○
ProControl is a great program that does the business. So, ASDG, how about bundling it with *ADPro* or *Morph Plus?*

The return of the new

Gary Whiteley looks at two revamped genlocks.

Marcam have revamped their old favourite 8802 genlock, adding a new external control unit. It was always capable of doing fades and inverse keying (or "Keyhole Effect"), but the access to these functions was always rather difficult, relying on a special cable and software. The new control box changes all that.

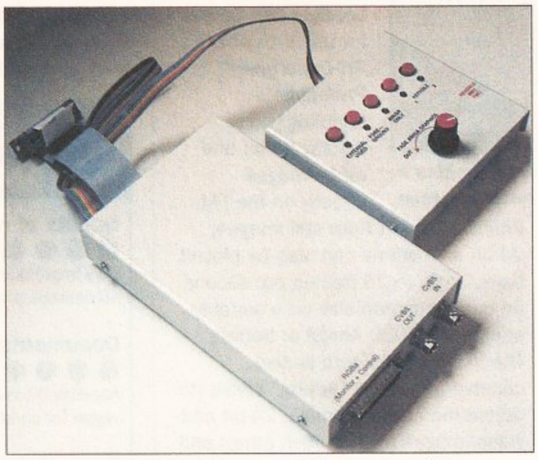
The unit still has its two BNC connections for composite video in and out, a still-too-short ribbon cable to attach to the Amiga's RGB port, and an RGB pass-through socket. Now there's a new long ribbon cable attached internally to a circuit board piggy-backed on the original PCB and to a metal control box outside.

The controller has five push buttons, each with an LED light, and one rotary fader which serves various functions depending on the switch selection. The first three buttons are for the normal genlock selection between Amiga graphics, straight video or graphics mixed over video (that is, "genlocked"). In each case the fader is used to fade from the currently-selected graphic mode to video or vice-versa.

The other two buttons select two further "Keyhole" settings. These allow a wider range of key colours than just the usual Colour 0 to be used, based on the overall colour value of each colour. For instance, if your Colour 0 is black (R0 G0 B0) but you also want another black to work as a key colour, you do it with Keyhole keying. The result is that more than one colour acts as a key ("transparent") colour and lets the video images show through. One Keyhole setting uses colours which have values up to R7 B7 G7, while the other only uses higher RGB values. In each case at least one of the colour components has to have a zero value.

Overall the picture quality is good, with no more than a touch of smearing on the most saturated reds and blues. A continuous video input is required if you want good-quality graphics-only output, but that's normal for genlocks in this price range. The 8802 FMC works with the OpalVision card, though a small "gap" at the top of the screen becomes evident and the quality doesn't reflect Opal's 24-bit output.

The flimsy-looking ribbon cable might seem to be a weak spot, but Marcam assure me that though they once dropped several 8802 FMCs on the floor all survived unscathed. Which must prove something.



The Rendale 8802FMC – an old favourite with an added control box that makes it much easier to use.

SHOPPING LIST

Rendale 8802 FMC genlock....£178
(Or upgrade your existing 8802 genlock to the 8802FMC for £45)
From: Marcam Ltd,
62 Tenter Road,
Moulton Park Business Centre,
Northampton, NN3 1AX.
☎ 0604 790466.

CHECKOUT 8802 FMC

Quality
●●●●●●●●○○
As good as you'd expect in this range.

Documentation
●●●●●●●●●○
Clear, informative and useful.

Ease of Use
●●●●●●●●●○
The fader and controls work smoothly.

Value for Money
●●●●●●●●○○
Not as cheap as some genlocks, but the quality is better.

Overall rating
●●●●●●●●○○
Despite its short ribbon cable, a good-value genlock offering established quality with competent back-up.

A mini gem

The MiniGen is another genlock that has been around a long time, but now manufacturers Lola are re-launching it at the hugely-reduced price of £50 – possible because they are selling direct to the public.

The MiniGen looks like a video modulator – about 6 inches long, and thin, with two phono connectors for the video input and output at one end and a connector to plug it directly into the Amiga's RGB port at the other. A toggle switch on the top of the box is used to select between Amiga, Video or Genlocked output.

Installing the MiniGen is straightforward, as long as there is enough room behind the Amiga to fit it. Plug it into the Amiga, connect up the video cables and that's it.

Now for £50 you wouldn't expect much, right? You'd be wrong. The keying is pretty clean, and the video signal doesn't look half bad either. Operation is a breeze – well, it would be with only one switch to play with.

The MiniGen's old dislike of interlaced graphics has been cured and it now works fine with *Deluxe Paint IV, Big Alternative Scroller, Scroller 2* and *Broadcast Titler 2*. If you've still got an old MiniGen in the cupboard you can have it upgraded for £14.99.

At this price there must be a catch. And there is. The MiniGen has no RGB pass-through, so you can't work on your graphics in crisp RGB – unless you don't mind doing a lot of cable swapping. The only output is composite video, but your graphics do appear in all their final glory, so you can adjust the colours to get them right on screen.

As you'd expect at this price, it can't handle fully-saturated reds and blues well (though neither can all expensive ones), but it does overlay graphics better than some genlocks which cost two to three times as much. Obviously the best way to check if it is suitable for your needs is to see it for yourself. But at this price I think you'll be more than pleased with a MiniGen. AS

Gary Whiteley can be contacted by e-mail as drgaz@cix.compulink.co.uk



Lola's MiniGen is a basic genlock with a toggle switch – easy to use, good quality, just no RGB pass-through.

SHOPPING LIST

MiniGen genlock ....£49.95.
(Or upgrade your old MiniGen for £14.99)
From: Lola Electronics,
Freepost, Market Harborough,
Leicestershire LE16 7BR.
☎ 0858 880182.

CALLING VIDEOWARE

In our Education column in *AS* 28, there was a misprint in the telephone number for Videoware, producers of anim brushes, backgrounds and special effects on CD. The correct number is 0925 851559. Sorry for any confusion.

CHECKOUT MiniGen

Quality
●●●●●●●●○○
Extremely good, for the money.

Documentation
●●●●●●●●○○
I had only a pre-release manual (a dot-matrix printout) but its contents were certainly okay.

Ease of Use
●●●●●●●●○○
Just lacks the RGB pass-through.

Value for Money
●●●●●●●●●●
This one will take some beating. A bargain for domestic and even some semi-pro users.

Overall rating
●●●●●●●●●○
If you don't want faders and don't need RGB pass-through, you won't find a better genlock bargain than this.

Tools of the trade

Tim Tucker looks at the latest upgrade to Blue Ribbon Soundworks' flagship Amiga sequencing package, Bars and Pipes Pro 2.

The Amiga is undoubtedly the most capable and affordable home computer for putting together multimedia presentations, with its superb graphic capabilities and built-in sound producing hardware. Blue Ribbon Soundworks are at the forefront of the development of musical software which integrates these flexible features, and at the top of its range is its *Bars and Pipes Professional* sequencer. The latest upgrade has taken the multimedia idea even further, integrating just about every aspect of the Amiga's capabilities into a powerful MIDI sequencing program.

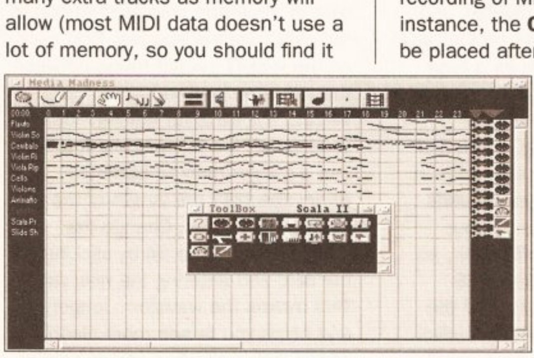
Before we get to the multimedia orientated features of *Bars and Pipes Pro 2,* though, let's look at the MIDI sequencing side of the software, which is after all what the program is predominantly all about. *Bars and Pipes* uses different windows to handle different tasks, and you can have as many windows open as memory will allow, enabling you to flick between different parts of the program easily and quickly. The **Tracks** window is where all the recording of MIDI events occurs, and the program takes an unusual approach which aims to make the whole process more logical and intuitive. It organises the input and output of the sequencer into a virtual pipeline, which visually represents as closely as possible what is happening to the data as it goes in and out of the sequencer.

Sequences of MIDI data are recorded into tracks, which range horizontally across the screen. There are 16 tracks arranged vertically in the window, although you can add as many extra tracks as memory will allow (most MIDI data doesn't use a lot of memory, so you should find it difficult to run out). The field at the far left of a track shows the track's name, and to its right is its input selector box, which when clicked on enables input to the track from an external MIDI keyboard. After the input selector there is an input pipe which leads into a miniature window, called the sequencer area, which shows the contents of the track, and an output pipe takes the information from there back out again. At the end of the output pipe there is a channel box where you determine which channel the MIDI data is on.

ALL TOOLED UP

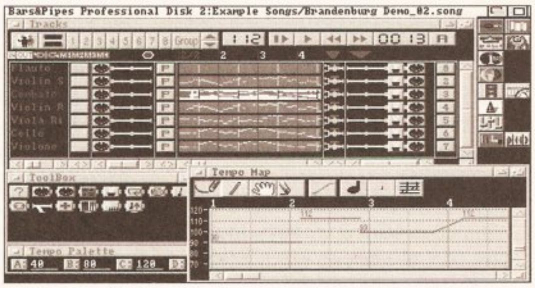
The key to the program is in the use of Tools, which are contained in a **Tool Box** window and dragged to the input and output pipelines to determine what happens to the data that goes through the pipe, where it comes from and where it is sent to. The most obvious example is the **MIDI In** Tool, which goes at the beginning of the input pipe and enables the input of MIDI data to the track. Thus, any incoming MIDI data is recognised as such and recorded into the track if **Record** is enabled. In order for the MIDI data coming in to be sent back out to a MIDI sound module, you need to place a **MIDI Out** tool at the end of the out pipeline too.

The **MIDI In** and **Out** tools are both essential for playing MIDI music, but there are plenty of other tools available which make the recording of MIDI data easier. For instance, the **Quantisation** tool can be placed after the **MIDI In** tool to quantise your music to strict rhythmic values, thus ensuring that your music is perfectly in time. See the box headed "music tools" on page 88 for a list of other useful tools in *Bars and Pipes Pro 2*.



The Media Madness window integrates all facets of the Amiga, so you can play anything from animations to laser disk players in time with your music.

The tools system has one major advantage, and that is flexibility. It's up to you how you arrange the tools in your tracks, which pipes contain certain tools and which don't and so on, and you can save a whole arrangement of pipes and tools as a default file which loads every time you load the program. Also, if any further tools are made available you can integrate them very easily into the system. The disadvantage is its relative complexity. This is especially the case if you're a first-time user of the program, and is a bit of a nightmare if you're a floppy drive user. Because of the huge number of tools supplied, the installation process doesn't actually load any tools into the program itself; it creates a new disk which contains all the tools supplied. This means that at first you're not sure which tools are essential and which you may be using most often. The manual gives a few tutorials which show you how the most important tools can be used, but it's not until you've read all the tool descriptions that you can be sure what will best suit you, and newcomers to MIDI sequencing could well find themselves totally bemused for some time. Of course, once installed the tools are there until you remove them from the program disk, but I still feel that the most common tools, such as **MIDI In** and **Out, Quantise** and **Transpose,** should be supplied as defaults from the start.



In Bars and Pipes Pro 2 you can have many windows open, and the program always prioritises MIDI messages to ensure that your music doesn't suffer.



Bars and Pipes has a very comprehensive array of editors, so you're sure to find one to suit you. Pictured here are the notation and tablature graphic displays.

MESSING ABOUT WITH IT

Once you've recorded your music you may well need to make some changes to it. You can actually carry out quite a lot of basic editing tasks, such as quantising or transposing, from the Track Screen using the **Toolize** function described in the Tools box, but for more detailed edits you need to load up the Graphic Editor. This is very quick to enter, simply requiring you to double-click on the track you wish to edit.

Bars and Pipes offers a variety of ways to view your music: a piano roll style grid, standard musical notation, a hybrid of the two, and guitar tablature. You can have all these editors available in a window at once, but the more editors you display, the slower the screen update, and it can get quite frustrating waiting for minor changes to redraw when you want to crack on. You can also view note velocities, pitch bend, control change, program change, aftertouch and system exclusive data, each using its own specific display areas. The editor contains tools for manipulating all the messages, such as **Move, Duplicate, Erase** and **Create,** which enable you to make just about any conceivable changes to your MIDI music. You can even print out the music in notation form from within the program.

GET THE WHOLE PICTURE

As well as the Graphic Editor, *Bars and Pipes* provides various functions which enable you to look at, and make broad changes to, all of your music. A **Tempo Map** function provides a way of specifying tempo changes throughout your songs, and you can even determine whether the changes are gradual or instant.

For a good graphic overview of the entire composition, the Song Parameters section enables you to enter lyrics, chord sequences, dynamics and time signatures, and view them at any time. This is a very handy feature which I haven't seen in any other sequencer in quite the same fashion, and many musicians will find its approach very appealing – it certainly beats trying to work out where you are on a piano roll system.

When it comes to actually arranging your music, *Bars and Pipes*

MUSIC TOOLS

There are many tools available for the musical applications in *Bars and Pipes,* and certainly too many to show here, but the following is a list of the most usable ones.

Tools can be used in three contexts. From the main Tool Box you can drag a tool into the input pipeline, which then processes the information coming in. Many tools have control windows which enable you to determine certain parameters; for example, in the case of the **Modulator** tool, by what amount you want the incoming notes to be transposed.

The program also supplies eight **Tool Trays,** which can store up to 16 tools each. You can place different versions of the same tool in these, thus enabling you to store a **Modulator** tool which transposes notes up an octave and another which transposes down an octave. This saves you having to constantly change values according to the situation.

Finally there's the Tool Pad, with which you can "Toolize" existing music. This is very useful, because you might not want to apply a tool to your music until after you've recorded it. For example, you might record the drums without a Quantise to see if you like it with a natural sounding rhythm. If the playing ends up too sloppy, you can then Toolize the music with the **Quantise** tool to get the strict rhythm required.

EXAMPLES OF MUSIC TOOLS

Branch Out – Sends a duplicate of the events entered to another track. Combined this with the **Keyboard Splitter** tool and you can record left and right hand keyboard parts to different tracks in one take.

CounterPoint – This tool creates a countermelody to the notes you play into the track. You can define the key and scale that the counterpoint uses to create its lines.

Doctor of Velocity – Sets all incoming notes to a predetermined velocity setting. Very useful for dance drum and percussion parts.

Echo – Echoes incoming notes at higher or lower volumes.

Event Filter – Only allows the MIDI event types you specify to be recorded.

Keyboard Splitter – Splits notes into different outputs, around a predetermined pitch.

Loop – Enables you to record looped sections of music.

MIDI In – Receives MIDI events at the MIDI In port of your MIDI interface and sends them into the sequencer.

MIDI Out – Transmits MIDI events out of your MIDI interface.

Modulator – Shifts notes up or down by a specified pitch.

Quantize – Corrects timing errors in your playing to a predetermined resolution.

Quick Patch – Generates Program Change messages using a slider, so you can easily change the patch on your keyboard or sound module.

Triad – Creates chords on top of single notes entered.

As well as all the tools supplied, you can create your own Macro Tools using the **Create-a-tool** editor. This is a very powerful feature, because it enables you to create a custom environment totally suited to your needs. For example, you could create a drum input tool, made up of 16th note quantisation, with velocities set to 127. Place the newly created tool at the beginning of the sequencer and save as the default file. Then, whenever you boot up *Bars and Pipes,* you'll be ready to record powerful drums in strict time.

has a dedicated Song Arrangement section. This displays all your bars of music as little blocks for each track, very similar to the Block Display in Gajits' *Sequencer One.* This way you can make standard edit operations to the song, such as copy whole sections as blocks and paste them elsewhere. To make it even easier, you can also define a number of bars as a Section, such as a Verse or Chorus. If you go through a song and mark all the relevant sections, you can then edit one section and let *Bars and Pipes* make the changes to all other sections which bear the same name – a very quick way of working, and a naturally musical approach to song construction. This is certainly an improvement on sequencers like Dr T's *KCS,* in which you have to make changes to all your sections manually, but it does require the initial stage of marking the sections out.

MULTIMEDIA

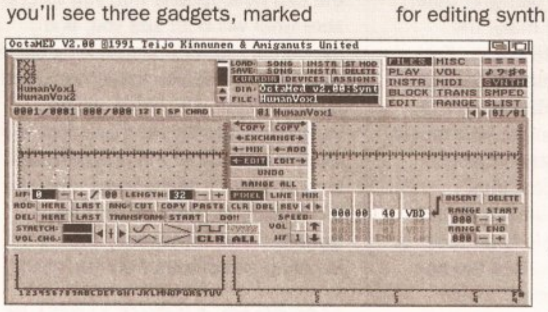
As already mentioned, *Bars and Pipes* has a very strong leaning towards multimedia integration – stronger than any other sequencer on the Amiga, and perhaps any other computer platform for that matter. If multimedia as a term is new to you, it basically means that the program in question enables you to integrate other types of media with your music, such as graphics, animations and video.

The program is capable of synchronising to MIDI Clock messages, which is the standard form of synchronisation between MIDI instruments. This means that you can run a drum machine or another sequencer in time with *Bars and Pipes,* or vice versa. For synchronisation to other media, such as multi-track tape or video, *Bars and Pipes* also supports SMPTE, the industry standard sync code. SMPTE time code specifies time in real time – that is, hours, minutes, seconds and frames (frames are a subdivision of seconds used in video and film work) – as opposed to the musical

SYNTHESIZING IN OCTAMED

In previous issues of *Amiga Shopper* we've seen how you can play pre-sampled sounds in *OctaMED,* and edit them in the sample editor, but there is another source of sounds available in the program. The Synth Sound editor provides you with a powerful editing tool which enables you to load synthetic sounds from disk, edit them, and even create your own sounds from scratch. This effectively turns your Amiga into a synthesizer, and provides you with a practically limitless supply of custom sounds to use in your compositions.

Synth sounds use simple waveforms to define their characteristics, and as a result take up very little memory. All editing and creation of synth sounds is done in the SYNTH editor. First load *OctaMED* and select the **INSTR** panel with the gadget at the top right of the screen. In the **TYPE:** field you'll see three gadgets, marked **SAMPLE, SYNTH** and **HYBRID –** select SYNTH to initialise a new synth sound. To bring up the SYNTH editor in place of the tracker display, click on the **SYNTH** gadget at the far right of the top of the screen. The Synth editor contains two windows for editing synth waveforms: the one on the left is the main display, and the one on the right serves as a copy buffer for intermediate editing. You'll find some examples in the **Synthsounds** drawer on your *OctaMED* disk, so use the **FILES** panel to load the sound **HumanVox1** from disk (click on **LOAD: INSTR** in the files panel once you've selected the file). You'll notice that the left hand window now displays a waveform, representing the loaded sound. You can play the sound using your Amiga keyboard, just as you'd play a normal sample.



The synth waveform is displayed in the left hand window. Click on the left EDIT gadget to select it.

You can immediately change the type of waveform displayed to create radically different sounds. First click on the **<-EDIT** gadget found between the two waveform windows; this selects the wave for editing. Just underneath the left window you'll see a gadget marked **LENGTH:** which specifies the length of the waveform in bytes. Change the number from 32 to 64 by clicking in the field and entering the new value. This makes the waveform longer, and helps you to see more clearly what's going on when you're editing.

At the bottom of the Synth editor are the preset waveforms – sine,

MEDIA TOOLS

The **Media Madness** section of *Bars and Pipes* requires Media Tools to define what kind of information will be played. You can drag any of the following tools into a Media Madness track, and then add the appropriate events, constructing a complete multimedia presentation from within *Bars and Pipes.*

ANIMal – Plays an Amiga ANIM animation file. You can get the animation to play along with your MIDI music, and even play animation files from your MIDI keyboard.

Command Performance – Sends commands to ARexx ports as well as files and devices (for example, the **SER:** device or **CON:** device). This enables you to integrate commands to any other software and hardware which responds to ARexx or other types of text message.

G-LOCKenspiel – Controls the GVP G-LOCK genlock unit, enabling full integration with video via the Amiga.

The Last Slide Show – Displays IFF pictures, such as those created in *Deluxe Paint.* You can assign different pictures to different notes on the MIDI keyboard, and even use Pitch Bend messages to change the colours.

POD People – Enables you to use MIDI notes to control the Panasonic Optical Laser Disk Player.

SamplePhone – Plays 8-bit IFF samples, mainly for use in videos and animations as sound effects.

Toasty – Enables you to control the NewTek Video Toaster video effects unit, either in the same Amiga as *Bars and Pipes,* or externally in a second Amiga.

time of a sequencer, which measures time in bars, beats and clock pulses. The program enables you to see your music in SMPTE time as well as measures and beats. This is essential for video work – for example, if you're doing the soundtrack to a video and you want a piece of music to start at a specific time in the film, or you want sound effects to occur at certain points (which of course you do want).

The real multimedia power of *Bars and Pipes* is found in the Media Madness section of the package. This provides an alternative track layout to the main Track screen, but enables tracks to contain other types of information apart from just MIDI. For example, one track could be showing an animation, while another plays MIDI music and yet another provides sound effects in the form of internal IFF samples. Once again, you can edit the tracks in SMPTE time or the standard sequencer time (bars and beats), which makes it incredibly easy to put it all together accurately and quickly. This is a godsend for anyone contemplating using their Amiga to put together their own multimedia presentations. You define each Media Madness track as usual using tools – see the box on media tools at the left for examples of what you can do with this very powerful and exciting feature.

LOST IN THE PIPELINE?

The most noticeable thing about *Bars and Pipes Pro 2* is the number of options available to you. There is simply nothing left out of this huge program, and the programmers must certainly have responded to every user's requests from the previous version. The only reservations I have are that, for strictly musical sequencing work, it can be very fiddly to get the results you're looking for. There's certainly no shortage of tools and functions, but because of the pipeline layout of the tracks you quite often have to do a lot of messing about to get what you want. This will be especially true for newcomers, and users entirely new to MIDI music could find themselves driven up the wall trying to work out what's going on. However, I must point out that the more you get to know the program, the easier it becomes, and the flexibility built into it enables you to create your own custom environment very easily.

On the multimedia side, there is simply nothing to compare with it. If you're looking to integrate MIDI music, video, animations or slide shows, this is the only program worth looking at. Powerful tools like *Bars and Pipes* can only help to establish the Amiga more solidly in the multimedia field, and as such it should be loudly applauded. **AS**

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CHECKOUT BARS AND PIPES PROFESSIONAL 2

Features
●●●●●●●●●●
More features than any other Amiga sequencer available.

Documentation
●●●●●●●●○○
It's all there in the manual, but it'll take you a good while to get through it.

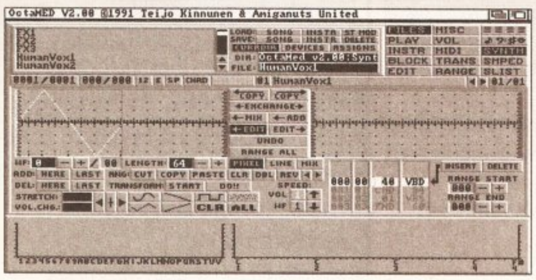
Ease of Use
●●●●●●○○○○
Very fiddly in places, and perhaps suffers from too many options for its own good.

Value for Money
●●●●●●●●○○
With all this on offer, even this hefty price tag looks a bargain.

Overall rating
●●●●●●●●○○
If you're looking to integrate your music with other media, it's the only choice. If you just want a powerful sequencing system, it still has a lot to offer, but other sequencers are easier to use and you could certainly find cheaper alternatives.

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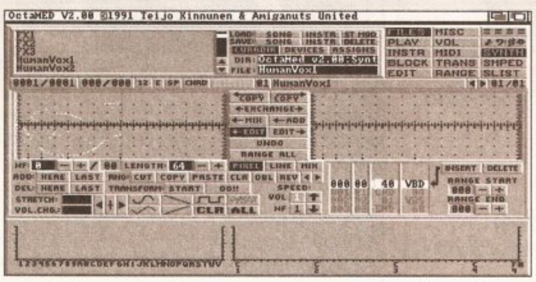
saw up, saw down, pulse, random and triangle waves. Many synths use these standard wave shapes as a basis to build more complex sounds.



If you're creating a sound from scratch, it's often easier to load up a preset waveform and edit it.

Also amongst these gadgets are the **CLR** and **ALL** buttons: the first deletes the current waveform, the second deletes both left and right waveforms so you can create a sound from scratch. Experiment with the different waveform types to see how the sound alters. If a sound sticks while you're experimenting, tap the spacebar on your Amiga keyboard to stop it.

You'll notice that each preset waveform type has a very distinctive (if basic) sound, which is often a good starting place when you're looking to build sounds of a certain timbre. However, for more complex sounds you'll want to edit the sample yourself. This is very easily done, by drawing your own waves directly into the waveform window. Click with the left mouse button and drag the pointer to draw your own wave shapes. There are three drawing modes available for editing sounds – pixel, line and a mixture of the two. Try these while drawing.



You can draw directly into the waveform window using the mouse pointer, giving you near-limitless potential.

The Synth editor is a very complex part of *OctaMED,* and these are just the very basics. You can select sections of the waveform using the right mouse button, and use the **RNG: CUT, COPY** and **PASTE** functions to transfer sections between the two waveform windows, but for more details on all aspects of the editor, check the documentation on disk. The Synth editor vastly increases the potential for integrating new and varied sounds into your *OctaMED* compositions.

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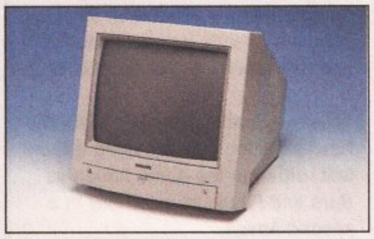
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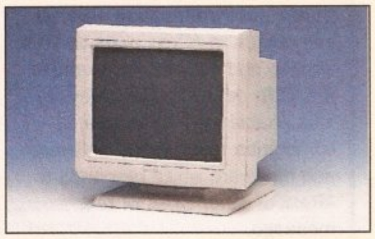


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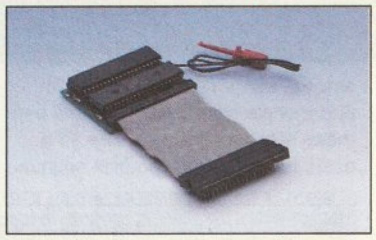
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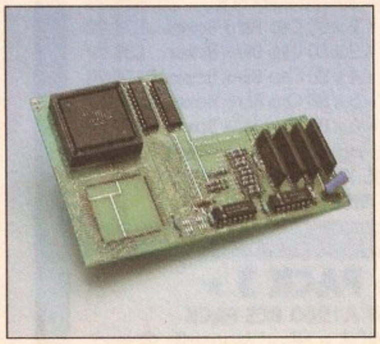
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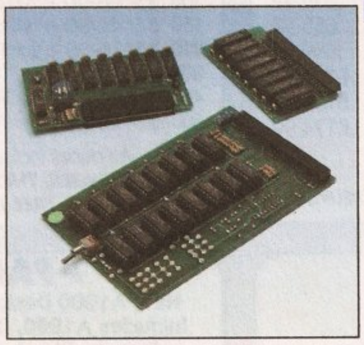
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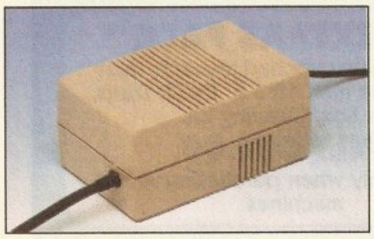
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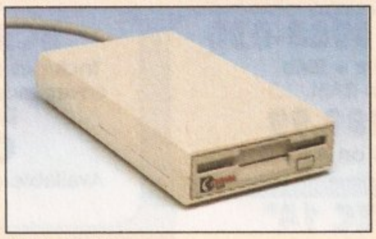
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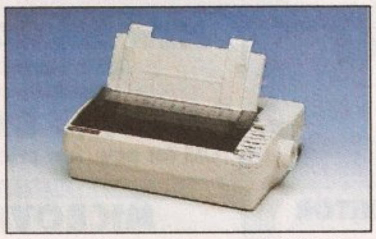
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Talking Shop

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NO AGA SUPPORT

I have just received a copy of the AMOS Pro Compiler, along with the AMOS Pro v2.00 upgrade disk. Jason Holborn, in his AMOS Action article (*Amiga Shopper* 27), devotes a whole paragraph to telling us how the upgrade will enable us to use the AGA chipset with glorious 256-colour screens. Having examined the manual I found no mention at all of anything to do with the AGA chipset, only a note saying that all new features available in AMOS Pro v2.00 would be explained in the help files after installation.

After the installation was complete, guess what? No AGA support, just a vague reference that it may be included in some future version of AMOS Pro. So what the hell was Richard Vanner saying about AGA support being confirmed in the upgraded version?

Oh, and if this is supposed to be an improved version of the compiler then maybe someone should have fixed the maths bugs which are even worse in this one than in the original.

John Burns
Sunderland

We contacted Europress Software, who told us that AGA support had to be omitted to get the compiler out on time. It will, we're informed, be included in an update, but as yet we don't know when.

Yes, the maths bugs are annoying, aren't they? Things like this are par for the course with early versions of compilers and the like, unfortunately, but I'm sure Europress are working even now to fix them.

FOR ART'S SAKE

Part of my A-level art course involves writing a dissertation on whether or not art produced on computer is credible. I would be grateful if your magazine has any information about artists who use computers.

Huw Jones
114 Biaenau Road
Llandybie
Ammanford
Dyfed SA18 2AQ

If anyone is interested in helping Huw out, please write to him directly.

SURELY DOOMED

I read with interest your interview with a so-called "Pirate" (*AS* 29), and as I had suspected, most of his "excuses" for cracking games just do not ring true.

The argument that "I only crack games because they're so expensive" will not wash with me I'm afraid – if you can't afford it, you go without. It's a fact of life. I can't afford an A1200 with hard disk, monitor and colour scanner, so does that give me the right to walk into Dixons and take one?

And anyway, if games are only cracked because they are too expensive, then why do pirated copies of Codemasters and other budget releases exist? Some companies have proved their commitment to the Amiga by releasing excellent games at affordable prices, only to be ripped off by the pirates as much as the bigger software houses.

Another poor excuse from the pirate was that one of the reasons for cracking games is to have a "free trial" of them, to evaluate them and see if they are worth forking out for. I would like to ask the pirate exactly what he thinks is on the cover disk of practically every Amiga magazine in existence? The answer is "playable demos." Companies release playable demos of most games into the public domain so that people *can* try before they buy.

I would like to finish by saying that I do not feel that FAST are taking their job seriously enough. I run a PD library from my home, and I receive new disks and PD lists daily from all over the country. The number of people who have "slightly suspect" disks in their catalogue is astonishing. Unless FAST act on this and stop companies from selling copied software, the Amiga software scene is surely doomed.

A Nony Mouse

I don't normally print letters from mice, but made an exception in your case because it's so well-argued. Shame I can't give you £25, though.

A BETTER LOOK

Why is everybody complaining about colour in *Amiga Shopper*? I think it gives the magazine a better look.

I really didn't notice the price hike (a reasonable amount for a bloody good read) until I read about the subscription price going up to £30. I duly sent off my subscription form, so that I could beat the price rise, and received the next issue. Now that is service.

But what's happened to the cover disk? I thought it was a good idea putting shareware, virus killers and source code on the disk. I didn't like the idea of "de-packing" it at first, but with Volumes 3 and 4 the "de-packing" was so easy!

Keep up the good work – more colour and most of all *bring back the cover disk!*

Cliff's mum (only kidding, it's...)
CJ Garson
Orkney

Well, the cover disk is back, and it's here to stay. As is colour. Glad you like it.

JUST TO STICK A SIMM IN

£25 WINNER

I would like to bring to the attention of your readers a problem regarding the expansion options on the Amiga 4000 computer. Commodore omit to say in their advertisements that Joe Average is not allowed to expand his machine internally for a year, thanks to the stupid guarantee sticker which covers the screws on the rear of the machine.

Now, I can understand any manufacturer wanting to do this on a machine such as the A500, because adding options internally on such a machine is certain to involve the extraction and insertion of costly chips and all the dangers associated with this delicate operation. However, the whole point of the box design of a machine such as the A4000 is that the lay-person can relatively easily and without undue danger add extra cards, memory and drives.

I have quite happily installed accelerators, disk drives, custom chips, ROM sharers and memory upgrades to Amiga 500s with no specialist knowledge, just a reasonable helping of common sense, and I object to being told that I have to have some spotty "Commodore approved" service engineer call, just to stick a SIMM in a slot and change a jumper, a task which is surely beyond only the most timid of computer users.

Once again, Commodore have produced a superb machine and then compromised its usefulness. Maybe you could give them the chance to state their policy towards user upgrades in the pages of your magazine?

MJ Elliot
Lowestoft

Kieron Sumner, Commodore's National Sales Manager, Multimedia, here states Commodore's policy:

"By nature, the Amiga 4000 is expected to be expanded, whether simply RAM or various cards to fully exploit the massive potential of the machine. We acknowledge this fact and would strongly recommend that any work which requires the machine to be dismantled should be referred to a recognised Amiga dealer. These dealers are fully conversant with the machines, software and cards and all aspects of setting them up safely.

"However, we also appreciate that there are times when this is not possible and therefore we accept that the user may need to fit cards themselves. Whilst this does not void the warranty itself, if as a result of the card being fitted, a fault develops at the time or in the future, the warranty would become void, and any necessary repairs would be charged. We would also stress that Commodore cannot be held responsible for any damage or injury caused."

AREXX FOR ALL

Jason Holborn shows you how can use ARexx in conjunction with ASDG's Art Department Professional to perform batch image processing.

So far we've discussed the automation of a set of image processing operations on a single picture file. But what happens if you want to carry out two or three *Art Department Pro* operations on a whole batch of image files? You'd be forced to run the script that we've covered so far over and over again manually. It's still much easier than actually performing the image processing operations manually, but we can do better.

What we need is some way of performing batch processing within an ARexx script. ARexx doesn't provide any form of wildcard directory reading, so you can't, for example, feed it a wildcard such as 'PIC#?.IFF' and expect it to read in every file that matches such a search criterion. But there are ways of getting around this limitation. The first method, which can be applied to just about any script that takes a command line argument, uses the AmigaDOS **LIST** command to generate an AmigaDOS script that calls the ARexx script for each file that you want to process.

The key lies in **LIST**'s powerful **LFORMAT** option, which enables you to take the output from the command and format it to suit your own particular needs. Say, for example, you wanted every file that began with **PIC** and ended in **.IFF** to be fed to a script called **S:Fred.Rexx**. You could do it by re-directing the output from **LIST** to a separate file and using the **LFORMAT** option to format the output; then any ARexx script could handle batch processing without having to be altered. After typing the line below, all you would have to do is to use the AmigaDOS **EXECUTE** command to run the script file. Try this one for size:

```
List DH1:PIC#?.IFF > RAM:MyScript LFORMAT "RX S:Fred.Rexx %s"
```

Examine the resulting script with:

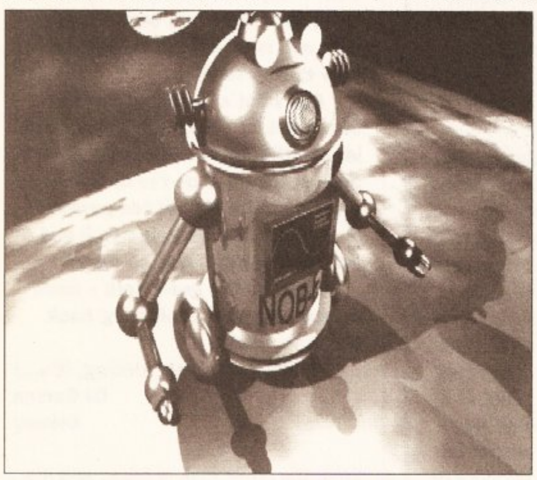
```
type RAM:MyScript
```

and run it with:

```
execute RAM:MyScript
```

LAST REQUEST

Fortunately, *ADPro* makes our life much easier when it comes to batch processing, as it enables not only ARexx control of its file requester, but also the capability of the user selecting several files together by holding down the **<Shift>** key. This method of batch processing is best used when you wish to write an ARexx script that runs as a macro from within *ADPro*. If you need to run your script from the Shell but you'd still like to take advantage of *ADPro*'s file requester, you can always pull the *ADPro* screen to the front of the display using the *ADPro* function **ADPRO_TO_FRONT** and then send it back again once the user has selected the files that he or she wants using **ADPRO_TO_BACK**.



Here's our 256-colour ray-traced robot (by Henri Bujko of Alternative Image) before we begin processing.

To demonstrate the use of batch processing under *ADPro*, let's take a look at a short snippet of code.

```
1. /* ADPro 'GetFiles' demonstration */
2. Options Results
3. Address "ADPro"
4. Getfiles '"Please select files..."'
5. If RC = 0 then
6.   Filelist = ADPro_Result
7.   FileCount = Words(Filelist)
8.   Counter = 1
     Do While (Counter <= FileCount)
9.      Filename = Word(Filelist, Counter)
/* Rest of your ARexx code here */
        Counter=Counter+1
        end
   exit
```

1. You must always start your ARexx scripts with a comment.

2. Every internal *ADPro* function that you call via ARexx returns a result variable called **RC** that is built into the ARexx language. Although it's fine for checking whether a function was successfully called, it doesn't enable you to retrieve any other information from an *ADPro* function. Instead ask ARexx to store any additional information into a variable called **<Portname>_RESULT** (where **<Portname>** is the name of the ARexx port that you're addressing).

3. Next we tell ARexx the name of the port that we wish to address.

BEGINNERS START HERE

What is ARexx?
ARexx is a programming language supplied free with all Amigas using version 2 and upwards of Workbench. It is an interpreted language, meaning that each line of an ARexx program is translated into a from the computer understands as it is executed. This means ARexx isn't the speediest of languages around, but it more than makes up for this by being easy to use.

What are its advantages?
ARexx's principal advantage over other languages is its ability to control other applications that are running on your machine. If such an application has an "ARexx port", then your ARexx program can send commands to the application via this port. These commands can simulate mouse movements and clicks, and key-presses, meaning you can automate repetitive tasks that would otherwise require your supervision. For instance, you could write an ARexx program that would load a succession of images into *Art Department*, manipulate each one in turn and then save the results out. While the programs were running, you could wander off and make a cup of tea, or even run another, totally independent program. With ARexx you can take full advantage of the Amiga's multi-tasking abilities.

How do I get it to work?
Firstly, a program called *RexxMast* must be running – this is the "interpreter", the program that looks at each ARexx instruction in turn and carries out the relevant operations accordingly. You'll find *RexxMast* in your System drawer. Double-click on its icon to set it going.

If you're going to be using ARexx a lot, then you'll want *RexxMast* to run every time you switch your Amiga on. To do this, just drag the icon into your WBStartup drawer.

How do I create ARexx programs?
ARexx programs are entered using a text editor. The program *Ed*, supplied with your Amiga, will do fine. Just open the Shell, type Ed followed by the name of the file you want to create, and type in your program. It's a good idea to add .rexx to the end of your ARexx filenames, just to remind you that they are ARexx programs. Once you've written an ARexx program, you can run it from the Shell by typing:

```
RX name_of_program
```

If, for example, your program was called example.rexx, and saved on your RAM disk, you would type:

```
RX RAM:example.rexx
```

JARGON BUSTERS

ARexx Port – Essentially a back door into an application that allows it to be controlled by ARexx. All programs that are ARexx-compatible have 'ports'. In order to tell ARexx which program you would like it to communicate with, you simply tell it the name of the program's ARexx port.

Batch Processing – The process of getting a program to work on several files automatically without the user having to manually load each file. Batch processing is often initiated using 'wildcards', which are a method of telling a program what files to work on simply by giving it a selection of criteria. Using a wildcard such as '#?.IFF' would force all files that ended in '.IFF' to be processed in a batch.

AmigaDOS Script – An ASCII file that contains one or more AmigaDOS commands (Dir, Copy, Delete etc) strung together so that several Shell operations can be performed simply by executing the script in question.

These names are automatically assigned by the host program, so you must use the name that the manufacturers quote.

4. This is where our script starts to get interesting. The function **Getfiles** tells *ADPro* to bring up its file requester on the control panel screen. You can customise the file requester a tad by passing an additional string that *ADPro* uses as a title for the file requester.

5. We then check the value of the internal ARexx variable **RC** to see if the user selected a valid filename. If so, a value of **0** will be returned. If any other value is returned, then something went wrong.

6. If the user selected a valid filename, ARexx copies it (or them) into the internal *ADPro* variable **ADPRO_RESULT**. We need to transfer this list of filenames into an ARexx variable that we can work with.

7. If several files were selected, all of their names will be separated by a space. To find out how many were returned by the **Getfiles** command, we make use of the ARexx word counting function, **words()**. The number of words in the string is stored in a variable called **Filecount**.

8. Each file needs to be processed individually, so we enter a loop that counts up from 1 to the maximum number of filenames in our list.

9. The file name is extracted from the file list using the ARexx function **Word()**. It's then stored in a variable called **Filename**, which can be used for loading and saving operations.

BATCH EMBOSS

Let's take a look at a fully working example that you can type in and use. The script below uses the same batch processing code that we've covered above, but also demonstrates how to load each image in, process it and then save it out with a filename extension. The image processing code is actually based around the embossing macro listed in the *ADPro* manual, but it has been significantly enhanced. Type it in using a standard text editor and then save it to the **S** directory of your boot disk under the filename **f1.adpro**. To actually run it, press **<F1>** from within *ADPro*. A file requester will appear; select the files that you wish to process (using **<Shift>** for multiple selection) and *ADPro* will do the rest. The resulting files will be saved out to disk with an **.embossed** extension.

```
   /* ADPro 'Batch Emboss'
    Written by Jason Holborn
    Save as 'S:f1.adpro' */
1. Options Results
   Address "ADPro"
   Getfiles '"Select files ▼◄
to emboss"'
   If RC = 0 then
    Filelist = ADPro_Result
    FileCount = Words(Filelist)
    Counter = 1
    Do While (Counter <= ▼◄
FileCount)
      Filename = ▼◄
Word(Filelist,Counter)
2.    SFilename = Insert◄
('.embossed', Filename, ▼◄
Length(Filename)-1)
3.    LFormat 'IFF'
4.    Load Filename
5.    Operator "negative"
6.    Load Filename 1 1 50
7.    Operator "color_to_gray"
8.    Contrast 50
9.    Execute
10.   Adpro_Display
11.   SFormat 'IFF'
12.   Save SFilename "IMAGE"
      Counter=Counter+1
      end
   exit
```

1. The script starts in exactly the same way as the example script that we covered earlier. ARexx links with *ADPro* and a list of filenames is requested from the user using the standard *ADPro* file requester. After checking that files were actually selected, the program process each in turn using a **Do... While** loop.

2. An **.embossed** extension is appended to the end of the original name for when the file comes to be saved. Note how the **insert()** function has to be used here because the original filename is contained within double quotes (""). The extension is therefore inserted just before the end set of quotes.

3. I'm taking the file format for granted here – if you want to process images of any other type, then set the format accordingly.

4. After setting the load format, we pull the image in to *ADPro*.

5. We then reverse all the colours within the image using the *ADPro* **negative** operator.

6. Next we place the same image on top of itself using *ADPro*'s image composition facility. It's offset by a single pixel in both the X and Y direction and the composition mix level is set to 50%

7. The mixed image is then converted to monochrome using the *ADPro* operator **Color_To_Gray**.

8. We adjust the image contrast to its top value – 50.

9. Calling the **Execute** command forces *ADPro* to generate a rendered image of the 8-bit grey scale data held in memory in the same display format as the original image. HAM images will be converted to 32 colours.

10. To the casual observer, we call the **adpro_display** command to instruct *ADPro* to display the rendered image data.

11. With all image processing operations complete, we can now save the image back out to disk. First though, we need to set the save format. In this case, it is set to **IFF**.

12. Finally, the rendered image data is saved back out to disk, complete with its file name extension. If more images are yet to be processed, the loop then returns to the start and the whole process repeats itself. AS

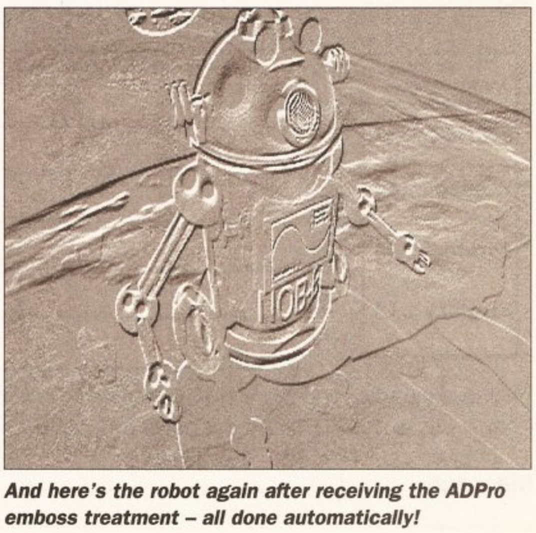
MORE FUN WITH ADPRO

Over the past couple of issues or so, we've taken quite an in-depth look at *ADPro*'s ARexx port, but even so we've only scratched the surface of what is undoubtedly one of the most comprehensive ARexx implementations to be found for any Amiga application. Next month we'll be moving on to a new program, so now would be a good time to take a brief look at some of the other powerful functions *ADPro* has to offer:

value = XSIZE	Returns the current horizontal size of an image
value = YSIZE	Returns the current vertical size of an image
ADPRO_TO_FRONT	Brings the *ADPro* screen to the front
ADPRO_TO_BACK	Sends the *ADPro* screen to the back
ADPRO_DISPLAY	Forces *ADPro* to re-display a rendered image
GETSTRING	Asks the user to enter a string into a requester
GETNUMBER	Asks the user to enter a number into a requester
GETFILE	Brings up the *ADPro* file requester
GETDIR	Asks the user to select a path
OKAY1 "String"	Brings up a "resume" requester
ORIENTATION	Returns the current orientation of an image
EXECUTE	Forces *ADPro* to render raw image data
IMAGE_TYPE	Returns a string (stored into the **ADPRO_RESULT**

variable) that contains information about the type of image currently loaded. One of six possible strings can be returned: **NONE**, where no image data is currently loaded; **COLOR** where raw un-rendered colour data is available; **BITPLANE** where rendered image data is available; **COLOR BITPLANE** where both raw and rendered data is available; and **GRAY BITPLANE** where grey raw and rendered data is available

RENDER_TYPE "rval" Changes the render type to one of the following modes: 2, 4, 8, 16, 32, 64, 128, 256, EHB, HAM, HAM8 or CUST. Note that HAM8, 128 and 256 colour modes can only be displayed on AGA-based Amigas.



And here's the robot again after receiving the ADPro emboss treatment – all done automatically!

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WANTED

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Typographic Park

There's real dinosaurs out there! Ancient DTP and word processing programs, that is, and old versions of Workbench that do all kinds of unspeakable things with fonts. Professor Jeff Walker explains how to handle them.

If you've just got on the bus I'd better tell you that this is the continuation of last month's article, which dealt mostly with bitmapped and PostScript Type 1 fonts. This month we'll be concentrating on Compugraphic fonts, although the words *bitmapped* and *PostScript* are bound to sneak into the story somewhere.

The trouble with Compugraphic fonts is that some of the popular word processors and DTP programs that use them do so in different ways. Since Workbench 2/3 supports Compugraphic fonts, it may appear silly for a program to handle them in a different way, but the main reason they do this is to enable people who are using earlier versions of Workbench to take advantage of Compugraphic fonts. I mean, support for Compugraphic fonts was first added to *ProPage* at about the time Workbench was being upgraded to version 1.3 and Compugraphic support from the Amiga operating system was still years away. And while it is fair to say that most people who are serious about their Amiga have now upgraded to Workbench 2 or 3, it would be a major task for the developers of programs like *Wordworth* and *ProPage* to re-write their code to come in line with Workbench, particularly since the way Workbench itself handles Compugraphic fonts is slightly different for 2.04/2.05 and 2.1/3.0, a fact that makes developers nervous about what might happen next.

The Workbench 2/3 Compugraphic font system expects the relevant files and directories to be in your **FONTS:** logical device, which is by default the **Fonts** directory on the disk you booted from. There are the two directories whose names begin with underscore characters: **_bullet,** which contains some font system files, and **_bullet_outlines,** which contains the fonts themselves – the **"fontname.type"** files in other words.

Workbench Compugraphic fonts also require a contents file **("fontname.font")** and a tag file **("fontname.otag")**. The program that actually loads and draws the Compugraphic fonts is a shared library in your **LIBS:** device, which is by default the **Libs** directory on the disk you booted from. Workbench 2.04 and 2.05 use a beefed-up version of **"diskfont.library"**. By default the smaller, bitmapped-only version of **"diskfont.library"** is in **LIBS:**, the beefed-up version being tucked away in the **Libs** directory on the **AmigaFonts** disk. This caused much confusion and tears (and letters to *Amiga Shopper),* mainly from floppy disk users who couldn't get the Compugraphic fonts to work, so for Workbench 2.1 and 3.0 the Compugraphic part of **"diskfont.library"** was split off and renamed **"bullet.library"**.

SHARING FONTS

It is perhaps worth mentioning at this point that using Workbench Compugraphic fonts from floppy is a frustrating experience. The files are big, so you can get only so many in your **FONTS:** device. They can take quite a while to load, slowing the screen refresh rate. And at print time the files have to be loaded again, slowing down printing. Yep, you sure have to be patient to use Compugraphic fonts from floppy.

ProPage keeps all its Compugraphic font files in one directory, which by default is **PPage/CGFonts.** Earlier versions of *ProPage* added to your startup-sequence (or required you to add) a **CGFONTS:** logical assign to this directory, but versions 3 and 4 don't bother – they keep a path list in **"S:PPage.INI"**. But since the *CG_Update* program looks for the **CGFONTS:** device, not the path in **"S:PPage.INI"**, you'd be wise to have **CGFONTS:** assigned to wherever your CGFonts directory is anyway.

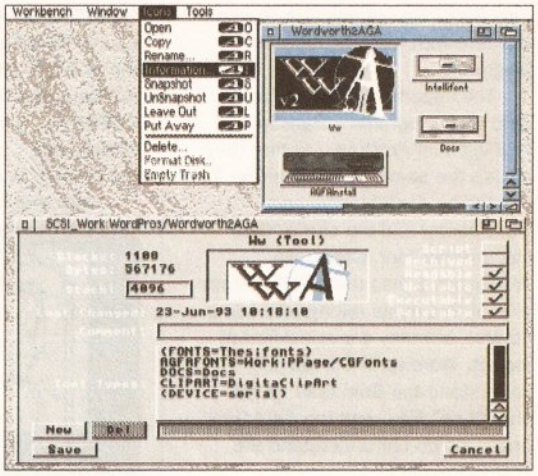
The *CG_Update* program reads all the **"fontname.lib"** files and writes a new **"if.fnt"** file in **CGFONTS:**. If you add a font to **CGFONTS:** and don't run *CG_Update,* the name of that font will not be contained in the **"if.fnt"** file and will not be usable in *ProPage*. It may still be listed in *ProPage's* **Typeface** requester – that's because the **Typeface** requester reads the **"fontname.dat"** files in order to list the available fonts. Why? Because the **"fontname.dat"** file contains the actual name of the font (as opposed to its filename) and is only a few bytes big, so it is quicker to read this than to hunt through all the **"fontname.lib"** files for the name of each font. So if using any of the fonts in your *ProPage* **Typeface** requester results in squares on the screen with little letters in the corner, it's almost certainly because you have forgotten to run *CG_Update*. You will have to quit *ProPage*, run *CG_Update* and then boot *ProPage* again.

Another way to get this "squares" phenomenon in *ProPage* is to mix Compugraphic font files that have been produced by different programs. For instance if you have used both *FontManager* and *TypeSmith* to convert a Type 1 font to Compugraphic, and then use the **"fontname.metric"** file from *Font-Manager* with the **"fontname.dat"** and **"fontname.lib"** from *TypeSmith*, *ProPage* won't like it.

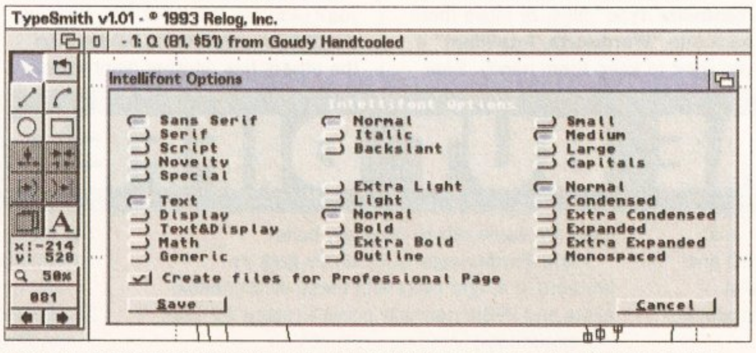
PageSetter II will not work with the *ProPage* Compugraphic font system because it is an old program. It requires a **"fontname.atc"** file for every font in **CGFONTS:**. By far the easiest way to get *PageSetter* working with Compugraphic fonts that have been produced with *FontManager* or *TypeSmith* is to upgrade to *PageSetter 3*, but if you really must stick with *PageSetter II*, get hold of the *PostMisc* disk from George Thompson Services (☎ 0582 462486) – it contains a utility which can create **"fontname.atc"** files.

An undocumented feature of *PageSetter 3* is that it uses the **"plugin.types"** file, just as Workbench does – only *PageSetter 3* looks for it in the **CGFONTS:** device instead of the **"FONTS:_bullet"** directory. If it can't find **"plugin.types"** *PageSetter 3* will still work okay, but if you copy **"plugin.types"** from **"FONTS:_bullet"** to **CGFONTS:** it will load fonts more quickly.

PageSetter 3 and *ProPage 3/4* use almost exactly the same fonts system and can happily share a single **CGFONTS:** device. They both handle the Compugraphic fonts via Gold Disk's **"FontEngine.library"** program in **LIBS:** rather than **"diskfont.library"** or **"bullet.library"**. *ProDraw 3* doesn't. While there is no



To enable Wordworth 2 to share the same font directory as ProPage and have access to all the ProPage fonts, you need to move all the ".type" files from "Wordworth/Intellifont" to CGFonts:, alter the Ww icon's AGFAFONTS tooltype, and then run AGFAInstall. Nothing to it, really, is there?



The reverse is even more fun. To enable ProPage to use the Compugraphic fonts that come with Wordworth 2 you need to run them through TypeSmith in order to create the ".dat" and ".metric" files required by ProPage.

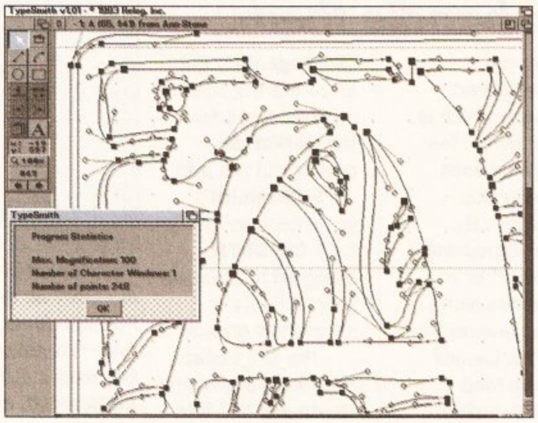
problem with *ProDraw* using the same **CGFONTS:** device as *ProPage* and *PageSetter*, it handles the fonts via the **"PDFontEngine3.0"** program, which must also be in the **CGFONTS:** device. Since *ProPage* and *PageSetter* do not use this, it won't interfere with the running of those programs.

The important point about the Gold Disk programs – *PageSetter, ProPage* and *ProDraw* – is that they all use the same **"if.fnt"** file (the file created by *FontManager* and *CG_Update)* and the same **"if.ss"** file, another font system file. *Wordworth 2* also uses font system files of this name (along with some others), but they are in a different format. *Wordworth 2* does not understand the Gold Disk **"if.fnt"** and **"if.ss"** files, and the Gold Disk programs do not understand the *Wordworth* files.

It is very simple to get *Wordworth 2* to share a font directory with *ProPage*, so that all the fonts you have in **CGFONTS:** are also available in *Wordworth*. Move all the **"fontname.type"** files from the **"Wordworth/Intellifont"** directory into **CGFONTS:**. Leave all the other files – the ones that don't end in **".type"** – where they are in **"Wordworth/Intellifont"**. Now alter the **AGFAFONTS** tooltype in *Wordworth's* **Ww** icon to read **"AGFAFONTS=Work:PPage/CGFont s"**, or wherever else your **CGFonts** directory is. But don't use **"AGFAFONTS=CGFONTS:"** because it doesn't work that way; the tooltype wants a path after the equals sign, not a device name.

Now you need to run *Wordworth's AGFAInstall* program. This first reads the **AGFAFONTS** tooltype from the **Ww** icon so it knows where to look for the fonts. It'll then read the entire contents of **CGFONTS:** and update its **"if.fnt"** file accordingly. You don't have to rename the **"fontname.lib"** files with **".type"** suffixes; *Wordworth* is quite happy to work with **".lib"** suffixes as well as **".type"**. Don't worry about *AGFAInstall* overwriting *ProPage's* **"if.fnt"** file, it will always update the one in **"Wordworth/Intellifont"**, not the *ProPage* one in **CGFONTS:**. *AGFAInstall* will write one file in **CGFONTS:**, a little one called **"libinfo.dsc"**, but this will not affect the running of *ProPage* at all.

Note that the above trick enables you to use all the *ProPage* **"fontname.lib"** fonts with *Wordworth 2*, but *ProPage* will not be able to use the *Wordworth* **"fontname.type"** files because they don't have **"fontname.dat"** and **"fontname.metric"** files to go with them. To create these you'll need to import the *Wordworth* **"fontname.type"** files into *TypeSmith* and export them in *ProPage* format. *TypeSmith* will write out the fonts with **".lib"** suffixes, and to save confusion you should then delete the **"fontname.type"** files, or move them back into **"Wordworth/Intellifont"** if you want to keep them handy. Bear in mind that when you import and export a font as Compugraphic with *TypeSmith* you will almost always degrade the font – in other words, it won't be quite as good as it was before. I always feel safer using the roundabout route of importing the **"fontname.type"** file, exporting PostScript AFM and PFB files from *TypeSmith*, and then using *FontManager* to create the Compugraphic files for *ProPage*.



A PostScript character like this can end up with thousands of points after being converted to Compugraphic – way past the maximum number of points allowed, so the font won't work in ProPage.

BARED TO THE ELEMENTS

Many *TypeSmith* users have stumbled across the "Maximum number of elements exceeded!" requester when importing large or complicated Compugraphic fonts. Yet if the same font is imported in PostScript format, *TypeSmith* doesn't complain. You may well also have discovered that the Compugraphic fonts that, according to *TypeSmith*, have too many elements don't work properly with *ProPage, Wordworth* and the like. The usual symptom is that the font appears to contain only part of the character set.

There's a reason for this. It's to do with the way curves are described. Try this experiment. Run *TypeSmith*, select **Project/New/Outline** and then hit the **OK** button in the requester that appears. Select the ellipse tool and draw a fairly large circle. It's got four control points or "handles" around it, yes? (Actually there are five, because the little square that is bolder than the others has another point exactly on top of it. That isn't important, just thought I'd tell you.)

Okay, now select **Project/New/Metrics** because we can't export as Compugraphic without doing this first. Select **OK** and then **Use** in the two requesters that pop up.

Now export as Compugraphic. Don't worry about the unique ID, just continue anyway. Don't select the **Save as ProPage Files** gadget, just hit **Save.** Stick it in **RAM:** using the default filename. Then select **Import/Compugraphic** and see what happens.

There are now many more control points around the circle, yes? The circle I drew now has 41 points instead of 5 – your one may be different; it depends on how big your circle was. Select **Project/Info** to get a point count, by the way.

Right. Now export this more-pointed circle as Compugraphic again, and then re-import it. Select **Project/Info.** You got more points, yes? Again, it depends on the size of your circle, but mine grew to 45 points. Exporting and importing once more, my circle remained stable at 45 points.

So what's going on? Well, the curves you see on your *TypeSmith* screen – the elements or "segments" between the points, that is – are described mathematically by the two points at either end of the segment and two additional control points that can be thought of as attractors. Click on one of the points around your circle and you'll see two little circles appear; these are the attractors. Pull them about and you'll see the shape of the curve change. But notice that curve is still one segment, or "element" as *TypeSmith* calls it.

Compugraphic curves don't work like this. Instead of two attractors they have only one, and more

SAME BUT DIFFERENT

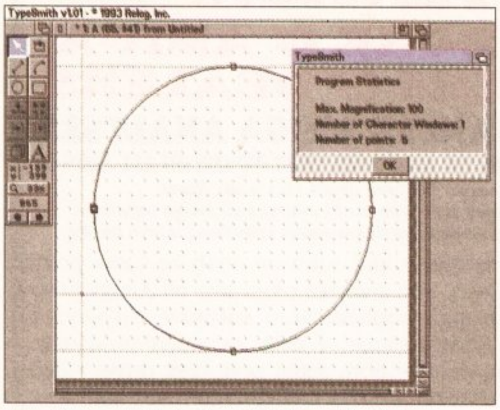
While on the subject of font conversion I must point out one of the pitfalls of collecting PD and shareware Type 1 fonts. Very often the AFM metrics file and the PFB outlines supplied with it don't properly belong together.

Oh, they might be the same filename alright, even the same font name, but often they have come from two different sources and are incompatible. This causes conversion programs like *TypeSmith* and *FontManager* enormous problems. Upon importing a "bad" AFM file *TypeSmith* will sometimes set all character widths to zero. If you export and try to use this font, the cursor will stay still as you type and nothing at all will get displayed. They *are* actually there, but you can't see them because all the characters have a width of zero. Converting incompatible AFMs and PFBs to Compugraphic with *FontManager* can have the same effect. Ring any bells?

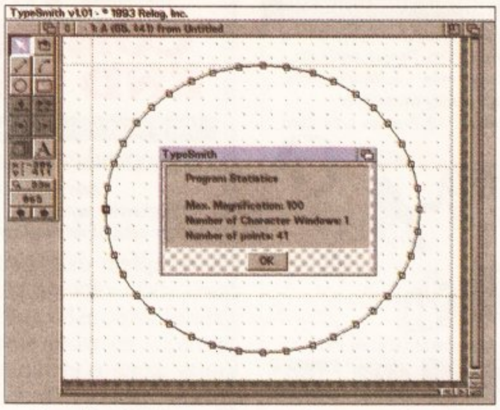
And *FontManager* sometimes gets its knickers in a right twist with these incompatible AFMs and PFBs, normally going to sleep for ever, but sometimes crashing the machine.

The way around this? Import the PFB into *TypeSmith*. Select **Project/New/Metrics** and accept the defaults, then export the Type 1 PFB and AFM files afresh, selecting **Adobe Standard Encoding.** *FontManager* will be much happier now, although keep in mind that some Type 1 fonts have weird custom encoding schemes that neither *TypeSmith* nor *FontManager* can deal with. This could again result in missing characters – or, more likely, characters not on the keys they are supposed to be on. You can sort this out in *TypeSmith* manually by copying and pasting characters in the overview panel and making sure that the compositions for each character are correct in **Edit/Compositions.**

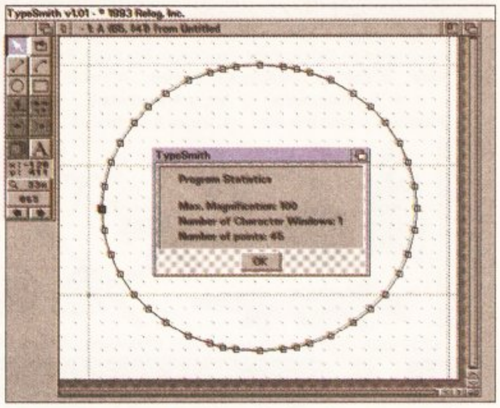
Hot news. By the time you read this *TypeSmith 2.0* should be shipping. It will have lots of new features, including rulers with draggable guides, clipboard support, more ARexx commands, font version tracking, an improved overview panel showing the actual character designs, faster screen redraws, stem and serif hints, preservation of loaded hints (so no more killing beautifully-hinted fonts when you want to add one character), auto-tracing of bitmapped templates, and (you are going to like this) auto-generation of bitmapped fonts, load and save bitmapped fonts, and edit bitmapped fonts. The upgrade to 2.0 from 1.0 will cost US$50 direct from Soft-Logik, and that includes a new manual. You read it here first.



Creating a circle in TypeSmith results in four segments or "elements" and five points, as above. Compugraphic curves are described differently ...



... from PostScript curves, so after exporting as Compugraphic and re-importing, the circle has been cut up into smaller segments ...



... and many more points. Doing the same again once more (as above) results in even more points and segments – quite likely too many to use.

segments have to be used to describe curves.

So what you see on your *TypeSmith* screen isn't what gets saved when you export as Compugraphic. First the curves must be turned into single-attractor ones, and then exported in more segments. When you import this Compugraphic file, it comes in as it was saved, in many more segments, but is then held in memory and on-screen as two-attractor curves. Exporting as Compugraphic again causes the same process to happen, converting to one-attractor curves and cutting them up into even more segments.

When you import a PostScript font that contains some complicated characters, even though **Project/Info** says there are only (say) 200-300 points in a character, when you export as Compugraphic the segments get sliced up, causing more and more points and segments to be added to the character, perhaps as many as 2,000 or more.

As with PostScript characters, there is a maximum number of control points allowed in Compugraphic characters. Try as I might I have not been able to unearth an official exact number (and I left people on three continents scratching their heads), but my experiments with *TypeSmith* and various programs that work with Compugraphic fonts, including Workbench, suggest that the maximum number of points is 381. I don't mean 381 points in the character as shown in *TypeSmith's* **Project/Info** requester, I mean after the character has had its segments sliced up by the conversion to Compugraphic. There's no way to know how many more points the conversion in *TypeSmith* will create, except to say that straight lines are not affected, and the more distance between two control points in *TypeSmith* and the more wavy the curve, the more segments it will be sliced up into in creating the Compugraphic version.

So it's not *TypeSmith's* fault, it's not *Wordworth's* fault or *ProPage's* fault, it's not even the much-maligned *FontManager's* fault. It's just the way the Compugraphic font format works.

And that's why programs like *PageStream, Art Expression* and *Final Copy II* have direct support for the PostScript Type 1 format. In a word, it's better. (Oh, alright, in two words then.)

So what do *ProPage* users do when they've got a Compugraphic font that contains characters that are too complicated to display? Well, after you've finished swearing you could import it into *TypeSmith* as a PostScript Type 1 and then manually cut down the number of points in the offending characters. But rather you than me. Life's too short. Okay. Instead you could export from *TypeSmith* each character in the font as a *DR2D* drawing, and then import each character into *Art Expression* and save each character as a separate *Art Expression* file, which is a file format *ProPage 4* can read. Not quite so fiddly, but almost as long-winded. Alright then. How about using *MIOutline* to create a *ProDraw* font, and then using the hotlink between *ProPage* and *ProDraw* to get the characters into ProPage?

Or you could you do the sensible thing and write a nice letter to Gold Disk in Canada politely requesting them to build direct Type 1 support into ProPage, *or else!*

CONFUSED? YOU WILL BE

We're going to finish this two-parter on fonts with a real head-scratcher for beginners. How do you print the on-screen Compugraphic fonts in *ProPage* to PostScript devices?

Aha! Trick question. You can't.

PostScript is PostScript, Compugraphic is Compugraphic. It's like expecting to be able to fit the door of a Ford Escort to the body of a Vauxhall Astra.

ProPage gets around this by keeping a duplicate PostScript version of every Compugraphic font in the **"CGFONTS:PS"** directory. If you've used *FontManager* you must recall how it asks you if you want the downloadable printer font(s) copied to this directory? If you said **No** you won't be able to print that font to a PostScript device or file, you'll have to convert it again and this time make sure you say **Yes.**

In the **Print to PostScript** requester there is an **"Include Downloadable Fonts"** option. When you select this, before your document is actually printed the PostScript versions of the fonts you have used in your document are loaded from the **"CGFONTS:PS"** directory and sent to the PostScript device. If you are writing out a PostScript file to disk, the full font definitions are included in the file that is written, so when you take it to a bureau they don't have to worry about what fonts you have used.

The important thing to remember is that if you apply to some text a style from the *ProPage* **Type/Style** menu, this will have no effect for PostScript printing. If you want an italic style, you need to have the Compugraphic and PostScript italic versions of that font in **CGFONTS:** and **"CGFONTS:PS".**

There is some confusion here because Gold Disk have supplied some Compugraphic fonts – like GarthGraphic, Times and Triumvirate – that react on-screen to the style set in **Type/Style.** This is because the **"fontname.metric"** files supplied with those fonts contain bold/italics information. But it is only superficial, a bit of a fudge really, a quick slanting or bolding algorithm rather than a properly italicised or bold font. If, for example, you have some text set in GarthGraphic and apply the italic style from **Type/Style,** when printing to PostScript and including downloadable fonts *ProPage* will expect the italicised version of GarthGraphic to be called **"GarthGraphic-I",** and will use this as the font name in the PostScript document. If you do not have a **"GarthGraphic-I.psfont"** file in your **"CGFONTS:PS"** directory, nothing will be downloaded, and when the document is printed the text that is supposed to be in the italicised style of GarthGraphic will instead be printed in the device's default font, which will normally be Courier, or sometimes Times.

So the rule is: to be able to download a PostScript font to a PostScript device (or file), that exact PostScript font must be available in **"CGFONTS:PS".** I mean, you can't expect to be able to use a font if you don't have that font, can you?

If you are buying-in PD fonts to use with *ProPage,* better to buy PostScript Type 1 fonts than Compugraphic. Some libraries peddling Compugraphic fonts don't bother to supply the *ProPage* downloadable fonts with them, which leaves you with a bit of a problem. It's possible to use the *CreateFont* program (supplied with *ProPage)* to create the downloadable fonts – you select the **"fontname.dat"** file as the Data File, select the **PostScript** button and hit **Start** – but what *CreateFont* does best, not to put too fine a point on it, is crash. It hasn't been properly updated for some three years and doesn't seem to like Workbench 2/3 much. But if you buy Type 1 versions of the fonts instead, you can always use *FontManager,* a much more stable program, to create the downloadables.

And that's your lot. You can order a copy of *AS* 30 on page 116 if you missed part 1, but I've not managed to cover everything in these two articles, so if you've got any fonts or DTP problems you want solved, write to me in the Amiga Answers section of *Amiga Shopper* and I'll see you there. AS

FONT SOURCES

These are some suppliers of PD and shareware fonts:
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Cambridge Sixty-Eight Group (CASE) Super-Basic, QDos, QL Emulator and QL software support on Amigas (serious users only). Meets 7.30pm, second Monday of each month, at Robinson Hall, Lolworth, Cambridge. Contact EPL Rowell, 347 St Neots Road, Hardwick, Cambridge CB3 7QL ☎ 0954 210692. (AS34)

Cheapo PD Club Non-profit-making postal PD, newsletters, advice. Membership £5. Contact Jason Meachen, Ivy Cottage, Chapel Road, Beaumont, Clacton, Essex CO16 0AR. (AS34)

Chic Computer Club Full details with an SAE to STAMP, Chic Computer Club, PO Box 121, Gerrards Cross, Bucks. For info contact Steve Winter ☎ 0753 884473. (AS34)

Computer Club A 16-bit club dedicated to being computer enthusiasts. Membership costs £15 per year. Contact 16 Laton Rd, Hastings, East Sussex ☎ 0424 421480. (AS34)

Enfield Amiga club Meet, swap, competitions, help for new users. For info contact Sean Clifton 32a Hoe Lane, Enfield, Middx ☎ 081 8042867 (AS34)

Hanover Computer Club DTP, PD, games, help, monthly meetings, beginners welcome. Free membership. Contact Colin Jones,33 Southover Street, Brighton, Sussex BN2 2UD ☎ 0273 602834. (AS36)

Hermit Computer Club Hardware help and information, program swapping. Meetings 7-10pm, Mondays. Membership £3 per term, 50p per night. Contact John Maynard, Hermit Centre, Shenfield Road, Brentwood, Essex CM15 8AG ☎ 0277 218897. (AS34)

Hertfordshire Amiga Users Group for beginners and experienced users. With BBS, PD library, programming, demos. Meets third Weds of each month at St Thomas Church Hall, Langley Rd, Watford. Contact Keith Alexander ☎ 081 421 1784. (AS36)

Kent Youth Computer Group Computer fair visits, video and DTP work, monthly newsletter. Membership 40p per month. Meetings at the North Youth Centre, Thursdays 7–10pm. Contact Jim Fanning North Youth Centre, Essella Rd, Ashford, Kent ☎ 0233 629804. (AS34)

Magic Windows Hardware projects, programming, PD, help and advice on all topics, beginners welcome. For more info send SAE to Frame, 26 St Benets Road, Stalham, Norwich, Norfolk NR12 9DN. (AS34)

Not the Night requires new members, coders in Assembler or C, GFX artists and musicians in any format (MED, PC/ST/NT etc). Beginners welcome. SAE for form to Andrew, 8 Lanark Road, Ipswich, Suffolk IP4 3EH. Membership £1.50 a year (goes back into the group). (AS34)

PD for Beginners Monthly mag on a disk + free PD progs. Contact M Macias, 48 Lavender Grove, Mitcham, Surrey CR4 3HU. Membership £3.60 for two disks (inc P&P). (AS36)

Robotronix Amiga Club Bi-monthly newsletter, tips, cheats, programming support, advice. Send SAE for details. Contact P Symonds, 36 Century Road, Cobholm, Gt Yarmouth, Norfolk NR31 0BX ☎ 0493 667161. Membership £15 a year. (AS34)

Rye Amiga Group Regular newsletter, swap/meet at the Rye Community Centre. Contact Oliver Campion, 71 The Mint, Rye, E Sussex TN31 7EW ☎ 0797 222876. (AS34)

Sensible magazine: reviews, tips, news, loads more. 50p or 20p + SAE. Contact M Street, 158 Hadleigh Road, Leigh-on-Sea, Essex SS9 2LP. (AS34)

Sittingbourne Co-op Computer Club Programming, PD, games, free write-in advice service. £10/year, £5 unwaged. Meetings Mondays 6–9pm at Mall beneath Regis Suite. Contact Andy, Unit 11, The Mall, 121–127 East Street, Sittingbourne, Kent ME10 4AQ ☎ 0795 842608. (AS34)

Slim Agnus PD library, BBS, advice from Amiga experts. Group meets the last Thursday of every month. Contact Philip Worrel, 115 Brocks Drive, North Cheam, Sutton, Surrey SM3 9UW. (AS34)

South 16 Amiga/ST User Group Bi-monthly disk based mag, discounts available from local stores, free advice and extensive PD library. £12/year. For more info send SAE to PO Box 16, Southampton, SO9 7AU. (AS34)

Southend Team Music, PD. Free membership. Contact Scotty, 52 Prince Avenue, Southend-on-Sea, Essex SS2 6NN ☎ 0702 333974. (AS34)

Twilight Advice on hardware and software, Fred Fish PD. Free membership, disks 50p each. Contact 13 Mavis Court, Ravens Close, London NW9 5BH. (AS34)

SOUTHWEST

Amiga Users Klub (Bodmin) Amiga computer workshops every Friday 7–9pm. Please write first with SAE – no stamp, no reply. Contact Jack Talling, 1 Windsor House, 19 Castle St, Bodmin, Cornwall PL31 2DX. Membership free (club now in fifth year). (AS36)

Ami-Info Interested in the serious side of the Amiga? Then send an SAE for details to Paul Caparn, Homeside, Higher Warberry Road, Torquay, Devon TQ1 1SF. (AS34)

Avon Micro Computer Club Desktop video, DTP, office applications and entertainment. Meet UR Church Hall, Muller Rd, Horfield, Bristol 1900– 2230, first and third Sat eve monthly. Contact Roger or Bob, 95 Downend Rd, Horfield, Bristol, ☎ or Fax 0272 311642. Membership £5 PA, then 50p per visit. (AS36)

Bournemouth Amiga Club Problems, fun, social beginners welcome. Free. Contact P Chamberlain, 36 Homeoaks, 30 Wimborne Road, Bournemouth, Dorset BH2 6QA ☎ 0202 296714. (AS34)

Bristol Amiga Club Disk-based monthly magazine: PD, reviews, news, help service, utilities, games, disk finder service, music specialists. 3 Parkstone Avenue, Horfield, Bristol BS7 0BX. Membership £10 a year. (AS34)

CHUD Free membership. Send SAE for details to Mr M Sellars, 103 Newward Rd, Bulford, Salisbury, Wilts SP4 9AH ☎ 0980 33154. (AS34)

EmuSoft PD, Utils, starting up help and advice to all users and programmers. Contact Nalpex, 48 Longhandstones, Cadbury Heath, Bristol BS15 5AP. Membership free. (AS34)

Exeter 16-bit User Group Programming. Andrew Deeley or Phil Treby at 25A Gloucestershire Rd, Exwick, Exeter, EX4 2EF. Meeting every Wednesday 7pm. Membership £6 per annum. (AS34)

Game Swap Club Swap original software and hardware. Membership £3. Contact Ade Ajidahun, St Andrews House, 125 North Road, St Andrews, Bristol BS6 5AH ☎ 0272 240399 (AS34)

MIDLANDS

Aden PD Advice and AMOS for beginners, cheats. Free membership. SAE plus disk to Den Rounding, 8 Primrose Lane, Miami Beach, Trusthorpe Road, Sutton-on-Sea, Lincs LN12 2JZ. (AS34)

BR & CJ Computer Club Regular disk mag packed with tips, reviews of games and serious software, game cheats database, demos and utils, very large PD library. Contact B Robinson at 23 Fairway Rd, Shepshed, Loughborough, Leicestershire LE12 9DS ☎ 0392 72889 or 03922 841296. Membership £1.25. (AS34)

Cacophony (Unlimited) Aims to create quality PD with AMOS and others. Help given. Mark Wickson, 49 Perrott Close, North Leigh, Witney, Oxon OX8 6RU. (AS34)

Coventry and Warks Commodore Computer Club Self-help, PD library, guest speakers, newsletter. Meets Christ the King Community Centre, West Hill Road, Coventry. Contact Will Light, 22 Ivybridge Road, Coventry, West Mid ☎ 0203 413511. (AS34)

Deluxe Cheats Disk User Group Software advice. Updates every 2 months! £4 for disk, £2 for updates. Contact Steven Frew, 96 Campden Green, Solihull, West Midlands B92 8HG. (AS34)

East Midlands Amiga User Group Self-help group for beginners and experienced users. Meets Willoughby Social Club, 7–10pm every Wednesday evening. Contact Richard Haythorn, 70 Felstead Road, Aspley Estate, Nottingham ☎ 0602 298075. Membership £5 a year. (AS34)

Hereford Amiga Group Help, exchange of PD and shareware. Membership free. Contact John Macdonald, Alma Cottage, Allensmore, Hereford HR2 9AT ☎ 0981 21414. (AS34)

Melton Amiga Users PD, serious, advice. No pirates. Beginners and experts welcome. Contact Stephen Mowbray, 68 Ferneley Crescent, Melton Mowbray, Leics LE13 1RZ ☎ 0664 63421 (evenings only). (AS34)

Shropshire Amiga Link Advice, monthly disk mag, PD. Free membership. Contact N Cockayne, 2 Dodmoor Grange, Randlay, Telford, Shropshire TF3 2AW ☎ 0952 591376. (AS34)

Sid The Kid Amiga Information on the Amiga 500, Plus, 1200. Free membership. Contact Sid Reeves, 75 Blossomfield Road, Solihull B91 1SA ☎ 021 705 8619. (AS34)

Software Exchange Service 13 Bournville Lane, Stirchley, Birmingham, West Midlands B30 2JY. For more info ☎ Michael Pun 021 459 7576. (AS34)

Solihull Computer Users Group PD swapping, tips, hints, news, etc. Contact Rich or Lee, 41 Leafield Road, Solihull, W. Midlands B92 8NZ. (AS36)

Note: this list is provided as a free service for amateur, non-profit-making user groups. *Amiga Shopper* does not endorse or recommend any particular group and cannot be held responsible for any problems or losses you might suffer.

GETTING YOURSELF LISTED – AN IMPORTANT NOTE

Your user group will be listed here free of charge for six months, then deleted to prevent defunct groups being listed indefinitely. The number at the end of each entry is the last issue in which that entry will be included. If you want your group's entry left in, just send in this coupon again a couple of issues in advance. PD libraries are now listed at the end of the PD section – this issue, page 112.

If you run a user group which isn't listed on this page, fill in the form below for your free entry. Send it to *Amiga Shopper* User Groups List, 30 Monmouth Street, Bath BA1 2BW. We reserve the right to refuse entries.

AS31

Group name ....

Type of activities ....

....

Place of meetings ....

Time of meetings ....

Contact name ....

Contact telephone number ....

Contact address ....

....

....

Membership fee ....

This is a new entry ☐ **an updated entry** ☐

SOFTWARE for free

In his ongoing quest for low-cost and no-cost software, the intrepid Ian Wrigley goes Fishing again, then casts his net even wider...

As usual, thanks to Anglia PD for supplying this month's portion of Fish disks – numbers 881 to 890, this time. Will Fred's Fish disks never end? Let's hope they don't – they are one of the most valuable resources for anyone with an Amiga and the desire to have top-class software at less than top-of-the-range pricing. Not, of course, that Fred's the only one distributing PD and shareware – it's just that he does seem to be the best, most consistent at the job. Long may he continue.

But there's been loads of other stuff flooding into the office over the last few weeks, too. If you've sent in a disk and it hasn't been reviewed yet, there are three possible reasons: one, it may not fit our brief – however great your demo or game may be, I can't write about it in *Amiga Shopper!* Two, it may be that we just haven't got round to it yet (you should see the box of packages that arrives on my doorstep every couple of weeks!) Three, and saddest, a few of the programs that we get sent just plain don't work. Or, if they do then they're highly unstable. Really, there's no excuse for this. There are hundreds of Amiga owners out there who will quite happily beta-test software so that you can be sure it works on as many combinations of machine and Workbench version as possible, so why on Earth produce something that's at best dodgy, and at worst could actually trash data on the hard disk?

Right, whinge over, on with the show...

GALER

Fish disk 882

First up this month is a program that I haven't actually tried; I'm listing it simply because it may be of interest to people who are seriously into electronics. *GALer* is a piece of software which enables you to program your own GALs (Generic Array Logics – I guess that in the UK that would be Generic Logic Arrays, GLAs). The supported chips are GAL16V8, GAL16V8A, GAL 16V8B and GAL20V8, GAL20V8A and GAL20V8B. The software is included on the disk; for the circuit diagram required to build the hardware interface, you'll need to send your DM20 or $15 shareware fee to the author, Christian Habermann, in Hamburg – he'll then send you the details. Once you've built the hardware and connected it to your parallel port, you can program GALs (or GLAs, or whatever) to your heart's delight.

Program rating: Er...

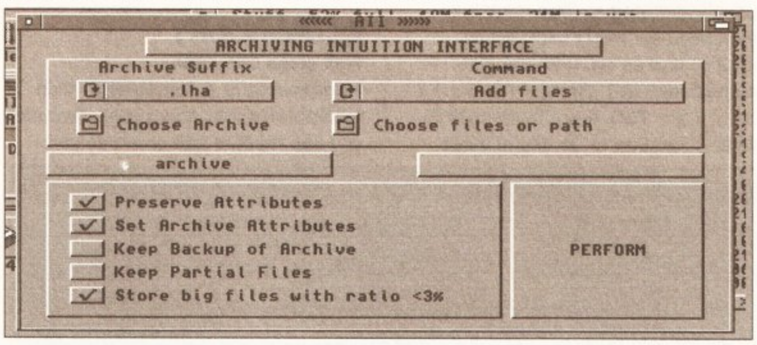
All

Fish disk 884

I've been a fan of *All* since an earlier version appeared on a Fish disk several months ago. This is now release 1.38, and adds a couple of new features – most importantly, it can now be used by people who only have Kickstart 1.3 (previously you needed 2.0 or above for the program to run). The author has also now added the .zip archive format (although from his documentation he doesn't sound too convinced...).

In a nutshell, *All* (short for *Archiving Intuition Interface)* puts a friendly Workbench face on those terribly useful, but terribly complex, file compression utilities like *LhA, LZH, Zoo, Arc* and so on. Whereas before you had to learn a dozen or more Shell commands to get them to do anything, now you just click on a couple of buttons, name your archive and Robert's your mother's brother. You still need the actual archiving commands resident on your startup disk, but *All* takes care of passing actual commands to them. It's true that you can't access some of the more arcane options in this way, but you can do just about anything that you'd normally want to, and the Shell is still there if you need more.

In fact, this really is a fairly simple idea for a program – but author Paul Mclachlan has implemented it well, and it can be highly recommended to anyone who wants the convenience of being able to shrink files without the hassle



All: file compression with a Workbench interface – and it's yours even if you haven't got anything more to offer the world than Kickstart 1.3.

RATING THE PROGRAMS

Just to be awkward, I rate the software that I review in two different ways, depending on what it is. Disk magazines, collections of clip art and the like are given a "value for money" rating, since you're essentially paying for one thing, or group of things, on the disk.

Single programs which appear in a collection of others, or programs which I've downloaded from bulletin boards, are given a "program rating", which reflects how good I think they are, taking into account usability, bug-proofness, my own particular (or should that be peculiar?) tastes and so on. Both ratings are out of a maximum possible 10.

BEGINNERS BEGINNERS START HERE BEGINNERS

What is PD?

PD is a general term which many people incorrectly use to refer to all freely-distributable software. In fact, PD (which stands for Public Domain) software or "freeware" is only one branch of this area; the other main one is shareware.

Essentially, freeware may be copied and used by anyone, although some authors place restrictions such as not allowing a PD library to charge more than a certain amount for the disk.

Shareware, on the other hand, should be treated more like commercial software. Although you are allowed to copy and pass around shareware programs, if you like one then you should pay the requested fee to the author – it's normally around £15 or less, and often entitles you to an upgraded version or a printed manual. Paying your shareware fees encourages software authors to write more programs – and if they don't, the Amiga scene will be a poorer place. Don't think that you're paying money for nothing, either – often hundreds or even thousands of hours of work have gone into creating a program, and it's only right that the programmer receives some reward for his or her work.

The third branch of software that we cover here is called licenseware. This is a form of shareware which is licensed to one (or more) PD libraries. In essence, when you buy a licenseware program you are buying shareware and paying the license fee at the same time. For this reason, you should treat any licenseware that you buy exactly as you would treat a piece of full-price commercial software – don't pass it around to your friends. You've only bought the right to use it yourself.

Can I pass other people copies?

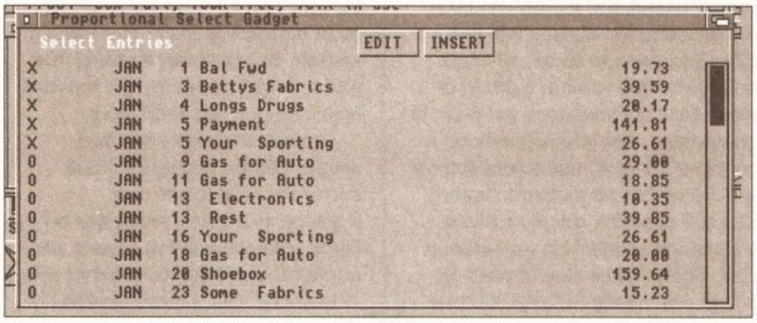
Yes – that's the way that PD reaches a wider audience. Just make sure that you have followed the author's requirements for distribution. These are normally things like not charging more than a certain amount for the disk, not altering the program, or making sure that all the original documentation is included on the disk.

You can also pass on shareware – but not any registered copies of programs. If, when you pay your shareware fee, the author sends you an improved version of the program, then be careful not to give that out. Only pass on unregistered shareware.

You should not, of course, pass on licenseware – it should be treated in the same way as registered shareware.

of getting their hands dirty with the CLI.
Program rating: 9/10

BUDGET93
Fish disk 884
This is a rather odd program. According to the documentation, it was first created in 1978 on an Apple II, and ported to an Amiga 1000 in 1985 – at which time it was converted from Pascal to C. The author, Ernie Nelson (who rather disconcertingly writes in the third person in his documentation, for some reason), now uses an A3000 to keep program development going. I say that it's an odd program because, given its gestation period, it's one of the least intuitive, most downright annoying accounts



Budget93: one of the less obvious accounting packages around... it seems to make it difficult to get even simple displays of debits and credits.

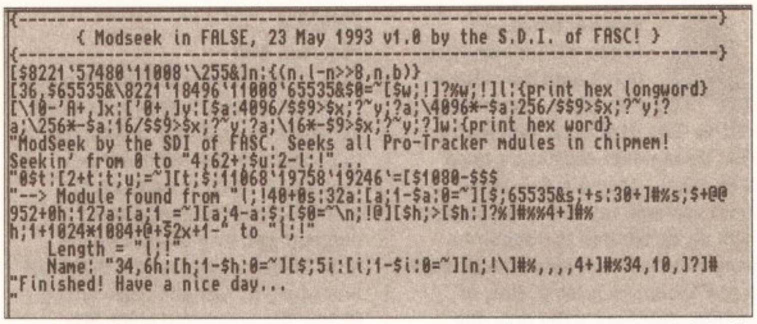
programs that I've come across in a long time. Okay, so maybe Ernie finds that it's easy to use – but I certainly didn't. In fact, I must confess that after a long time trying to fathom how I could get a neat little listing of credits, debits and a running balance, I gave up and went back to the patent Wrigley "keep taking money out until the machine chews your card" method of keeping my accounts. Primitive, yes – but I really don't have time to faff about with such a painful program, just to be told how poor I am.

There are better – much, much better – accounts packages than this one. I urge you to use one of them instead.
Program rating: 4/10

QUICKTRANS
Fish disk 884
QuickTrans is a package of libraries which are direct replacements for Commodore's **"mathtrans.library"s,** which you'll probably find in your **Libs:** directory. They contain completely rewritten mathematical routines which are used by many programs and should work about twice as fast as Commodore's originals. The package is freeware, and you can install it simply by renaming the component files and replacing the originals (you should, of course, make sure that you have a backup somewhere just in case it all goes horribly wrong). The author, Martin Combs, claims that the libraries should be compatible with all software, and provides versions for the 68000 series and also specifically for 68020 and higher processors, which should work another 10% or so faster.

And... that's it, really. Faster maths, if your programs need it. (If a program uses the **mathtrans** library, it will almost certainly say so in the documentation.)
Program rating: 8/10

FALSE
Fish disk 885
I was intrigued by this program; it's actually a compiler for what the author, Wouter van Ortmerssen, describes as "a language that looks cryptic and fuzzy (in the APL tradition)." In other words, impossible to read! But the really neat bit, from a train-spotter's point of view, is that the project was devised so that Wouter could build a working compiler in just 1K of memory. Think about that for a minute – it's a seriously cool achievement. Of course, some things had to go to squash the whole compiler down: error reporting, error checking, Amiga-specific features such as Workbench support and so on. But there's still a fair bit that you can do in *False*, and it's great mental exercise, if nothing else, to learn a new language and try to write



False: probably the most complex-looking programming language ever, but if you enjoy a real brain-straining challenge, you'll probably love it.

programs in it.

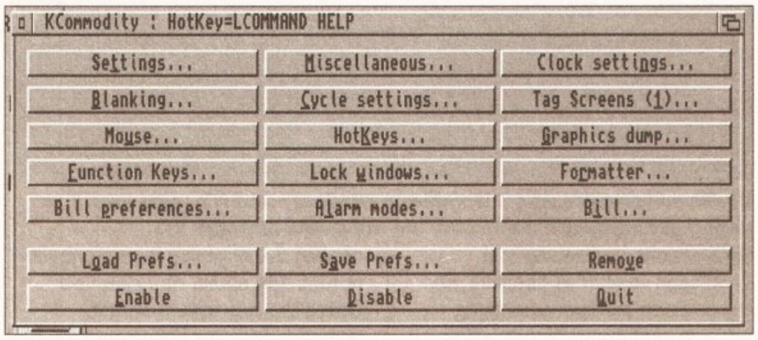
And *False* will certainly provide you with a headache or two before you get the hang of it! It works in a vaguely similar way to Forth – that is, it uses Reverse Polish Notation (RPN). Briefly, that means that it uses a "stack", and you must enter numbers before you use their operands. So to add the numbers 2 and 3 together using RPN you'd enter something like "2 3 +", rather than the more conventional "2 + 3".

False also reduces its commands to the shortest possible form – often single characters or symbols. This means that the compiler can be smaller, since it isn't checking for long tokens, but it also makes programs somewhat unreadable unless you're well practised in the language. As an example, take the factorial function, usually denoted *x!*. This means *x* multiplied by *(x–1)* multiplied by *(x–2)*... and so on, until the last multiplicand is 1. So 6! = 6 x 5 x 4 x 3 x 2 x 1 = 720. It's a trivial task to write a function to do this in most challenge of writing code in a language this convoluted (it's the masochist in me, I guess) then you'll love *False*.

The documentation is good and there are some example programs supplied, which show that you really can do sensible things in the language – for example, one program takes a source file and makes it readable by splitting lines at the first space after a certain position along the line, saving the results to a specified output file. Another seeks out all the Pro-Tracker modules contained in your Chip RAM – and I defy anyone to produce source code that will do this with less comprehensible-looking source code! (See the screen grab for the actual code, to see what I mean....)

False is great fun; check it out!
Program rating 9/10

KCOMMODITY
Fish disks 885/886
KCommodity is a Commodity which incorporates just about every feature you can think of into one massive



KCommodity: all the Commodities you'll ever need, in one package. It's got everything from an alarm clock to a mouse configurer for left-handers.

programming languages; at the most, in BASIC it would take about three lines, while a C programmer could do it in one. The BASIC version would be easily comprehensible, the C implementation slightly trickier but still perfectly readable after a little practice. But now consider the *False* version of this function:

```
[$1=$[\%1\]?~[$1-f;!*]?]f:
```

Frightening, isn't it! It's called with a line like

```
6f;!
```

which returns the correct answer, 720. If you're already running, screaming, then *False* isn't for you. But if, like me, you're intrigued by the package. It comes on two Fish disks; the first contains an archive of the Commodity itself, along with documentation, while the second has all the source files.

This really is a monster. It would take forever to list all the features, but a few include window activation by mouse click or keystroke (or just moving the mouse over the window); time display by a clock either in the menu bar or in a separate window; an alarm clock; window/screen cycling; LeftyMouse (for any left-handers out there); use the [Esc] key to close windows; phone bill

continued on page 109

GET IN CONTACT!

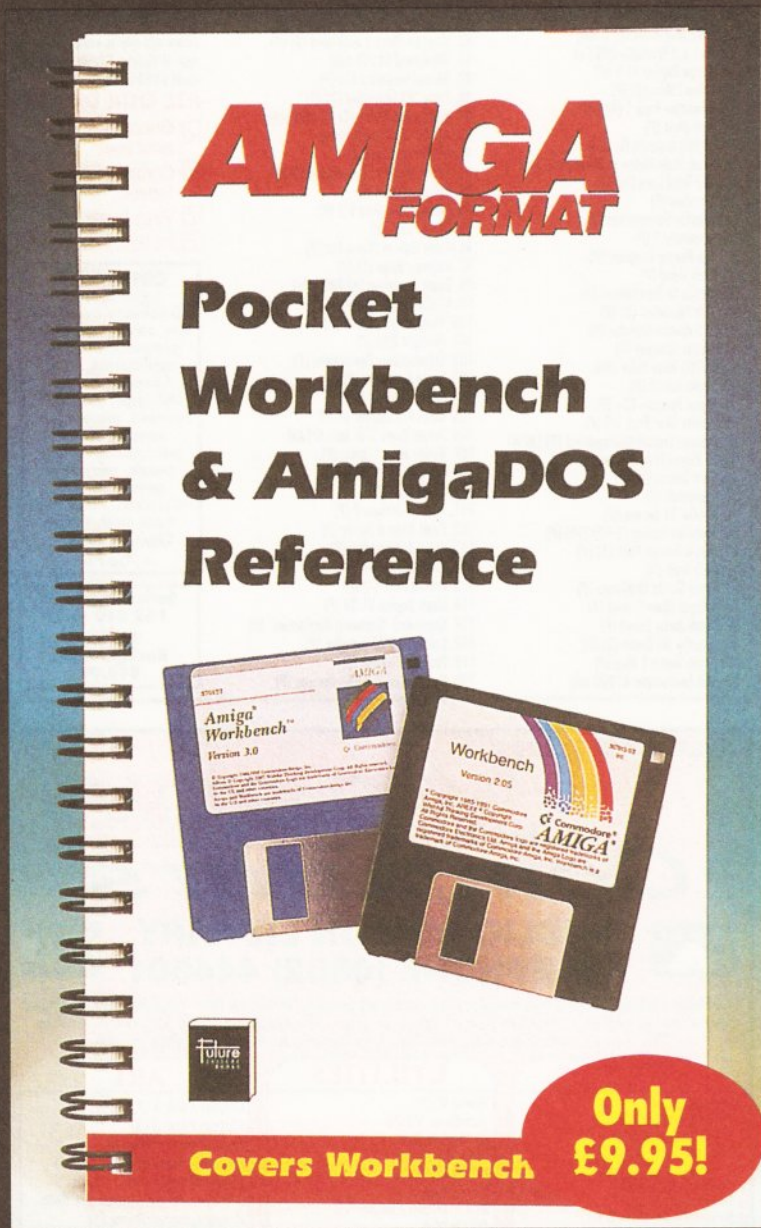
If you've written – or discovered – any PD, shareware or licenseware that you think should be reviewed in these pages, or if you've got any comments or suggestions, write to Ian Wrigley c/o *Amiga Shopper*, 30 Monmouth Street, Bath BA1 2BW. Alternatively, you can contact Ian on cix as 'iwrigley', or on the internet as 'ian@vampire.demon.co.uk'.

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❑ ^+ V390 DESK TOP PUBLISHING Extra features,Text & Graphics Editors
❑ ^+ V392 AMICASH BANKIN Best bankin program that I have ever used
❑ ^+ V394 CHEMESTETICS v2.14 Draws molecules using the calotte model.
❑ ^+ V401 WINDOWBENCH (2) Give your Workbench v1.3 a stunning new look and update your aging software.
❑ ^+ V424 ANTI-FLICKER Said to stop the flicker in High Res mode
❑ ^+ V444 PRINTER DRIVER DISK III Now contains instructions on how to install them. Theres about 90 drivers
❑ ^+ V479 CHESS & UTILITIES A collection of chess related Puzzles.
❑ ^+ V489 AMIBASE PRO v2.0 This is most popular PD Database program.
❑ ^+ V490 MESSY SID v2.0 Reads MS-Dos disks, Transfer any text files to & from an IBM PC, ie PC to Amiga
❑ ^+ V523 DICE C COMPILER (2) Matthew Dillons full featured powerful C compiler & environment system.
❑ ^+ V536 CATALOGUE UTILITIES A collection of utilities used to Catalog disk/ Video & Tape collections (2)
❑ ! - V567 GENERATORS Selection of utls & Printer Driver Generators.
❑ ^+ V569 DUNGEON MAPPER v1.1 Can design maps for dungeons & Towns.
❑ ^+ V573 FILE & HD HDClick v2.0, File Minder, DosControl, & tools. (2)
❑ ^+ V575 HOME BUSINESS Based on word processing, Data Management, Spreadsheets, Accounts & Printing. (6)
❑ ^+ V583 ICON EDITOR III v2.0 Create Icons upto 640x200. Edit or Create
❑ ^+ V587 GELIGNITE FONTS (2) If you want some coloued DPaint fonts.
❑ ^+ V610 GOLF SCORES v1.84 It will record each round you play & Store it
❑ ^+> V611 FOOTBALL LEAGUE EDITOR v1.1 Want to update your teams league position as the results come in.
❑ ^+ V620 ASPICE v3.2 Full featured program for electric circuit.
❑ !- V624 NIB COPIER v2.0 Will copy in AmigaDos + special parameter copy.
❑ ^+ V627 DPAINT FONTS No's 1-3 (3) The latest selection Fonts for use with any IFF Painring (like DPaint) / DTP Program.
❑ !- V635 IBeM EMULATOR v1.5 Is a CGA Colour IBM-PC Emulator for Amiga.
❑ ^+> V660 HOME MANAGER Is an addressbook,inventory database, 2-do list
❑ ^+ V661 VERTEX Create 3d objects with-out using the X, Y & Z views. Loads Sculpt 3d+. Now also contains Sci-Fi fonts
❑ ^+ V662 DCOPY v3.1 PRO You can select the speed of the disk drive, Copy modes, Dos, Nibcopy, Ver & safecopy

❑ ^+ V678 DRAW MAP v4.1 You can generate world maps in detail views. 3d or 2d ❑ 2Mb (2) or ❑ 1Mb V263 (1 disk) old of that extra hard game & Cheat.
❑ ^+ V681 GAME TAMER v4.59 Get a hold of that extra hard game with a cheat
❑ ^+ V685 ASTRO ASTROLOGY v3.0 Best Astrology program on the Amiga
❑ ^+ V686 MULTIDOS v1.12 After this program has been installed your Amiga drives can then read 720k IBM Disks.
❑ ^+ V688 MAGNETIC PAGES v1.30 Creates disk based mags with graphics
❑ ^* V690 WB 2/3 UTILITES Contains the programs that should have been with WB 2.x Take full advantage of the many NEW capabilities that are available. (2)
❑ ^+ V693 HARLEQUIN VIDEO ART A video production with backgrounds (3)
❑ ^+ V698 AGRAPH v2.0 Brings the world a cheap draw Bar, Line, Area & Pie chart production/ presentation program.
❑ ^+ V705 MED v3.21 Excellent update to the famous music program
❑ ^+ V710 AREXX TUTORIAL Includes several samples of Arexx scripts & some sample programs. ARexx comes free on all Workbench v2.x and better machines.
❑ ^+ V711 UNIX Contains a working demo of Minix a Unix) based System which is call campatable.
❑ ^+ V715 BIBLE The entire text of the new Testament & Torah Old Testament (3)
❑ ^+ V719 FREECOPY v1.8 Removes protected games copy protection so that the user can install them on HD.
❑ ^+ V727 ART OF MED 2 Another excellent select of Med tunes.
❑ ^+ V731 AMOSBROT v1.1a Logistic Equation, Coast lines & trees Fractals
❑ ^+ V742 ONLINE v1.4 Program will allow you to find cheats within games.
❑ ^+ F691 PROFESSIONAL C MANUAL v3.0 Is the largest collection of utilities, documents & examples for C, It consists of six manuals, with over 40 chapters (5)
❑ ^+ V757 AMIGADEX v1.61 Creates a card index database system.
❑ ^+ V758 TEXTPLUS v4.0e Another update of this excellent Word processor program. Requires Hard drive
❑ ^+ V759 TEXT ENGINE v4.0 Up-dated version of the Word processor with AZSPELL. Excellent spell checker
❑ ^+ V761 A-GENE v4.18 The most popular genealogy database program.
❑ ^+ V770 ACCOUNT MASTER v2.12 Excellent Amos written program
❑ ^* V773 WB v2.x WINDOWBENCH v2.0 Excellent Workbench replacement for all WB v2.04+ Users (2)
❑ ^* V777 VOICE CLI v7.0 The idea is to control the CLI with your own voice.
❑ ^+ V778 RAYSHADE v4.0 Complex Ray tracing package. 2Mb (3)
❑ ^+ V782 FORMS Create, Edit, Draw , Colour & print your own forms
❑ ^+ V783 PROGRAMMING TOOLBOX Many programs to help in your development efforts (most C but some in basic).
❑ ^+ V784 AREXX (2) disks which contain Arexx programs & examples
❑ ^+ V786 PASCAL This disk contains everything needed to program in Pascal. Includes a68k 68000 assembler & more.
❑ ^+ V787 PROGRAMMER TOOLS GadTools to design your user interface to your own programs using all of Amiga DOS 2.0+s new features. Also RegTools.
❑ ^+ V790 ANIMATION UTLS Includes CyroUtils for splitting, combining, and creating animations from IFF picture files.
❑ ^+ V791 DIRECTORY ULTS Highly recommended programs which are designed to make CLI tasks virtually obsolete.
❑ ^+ V794 GRINDER Complete graphic conversion package that supports GIF, JPeg, Atari St (Neochrome / Degas), PCX, Targa, TIFF, Ham-E and IFF Format pics.
❑ ^+ V799 ADVENCED UTILs SerNet & ParNet, Connect 2 Amigas & share resources via serial or Parallel ports. MyMenu
❑ ^* V806 WB v2.04 UTILITIES (2) 2nd collection of WB v2.04+ utilities that take advantage of the NEW capabilities.
❑ ^+ V811 ELECTROCAD v1.42 & PRO TOYPER Electronics drawing Programs.
❑ ^+ V812 CANON This disk contains Printer Drivers & Canon Studio, Gives better print output for ANY 9 pin printer.
❑ ^+ V815 FILE & HD 2 DirWork v1.62 MegaD File copier like Disk Master (2)
❑ !- V817 A500 PLUS EMULATOR As it sounds will let v1.3 / v1.2 owners run WB v2.x+ software WITH-OUT any need to purchase the Workbench v2.x chips.
❑ ^+ V818 INSCRIPT v1.1 Produce video titles. IFF Pictures as back grounds
❑ ^+ V820 BBBBS v5.9 Baud Bandit bulletin Board System Ffures include up to 99 file libraries, interface to extra devices
❑ ^+ V821 SNOOPDOS v1.5 Monitors Dos calls to see what library, devices, fonts are required if a program won't load
❑ ^* V822 BACKUP v2.43 A Hard disk backup program that features, multi-drive support, full backup, compression.
❑ ^ + V823 POWERPLAYER v3.4 Very powerful, user friendly module player.
❑ ^ + V826 AHDM v3.4 Hard Drive Menu. When placed in your startup-sequence, offers a 16 page menu
❑ ^+ V827 REPAIR-IT 2: NewZap v3.3, Sector file editor. FIXDISK v1.2, Recover as much as possible from a defective disk
❑ ^+ V841 MODULA-2 Contains modula-2 language on the Amiga.
❑ ^+ V842 SID v2.01 Sid can be used for various operations, like file copieng, re-naming, deleting, Moving, Formatting ect
❑ ^+ V844 DELITRACKER v1.3 Powerful & system friendly music player. Will play over 40 difference types of modules.
❑ ^+ V845 Q.M.J v5.31 Generate julia sets & complex Quaternion Julia slices.
❑ ^+ V846 SCOPIOUS MAPPER An excellent Dungeon mapping program
❑ ^+ V848 SLIDESHOW GENERATOR v3.1 Creates slideshows of pictures in various formats for the amiga.
❑ ^+ V850 FRAC v1.1 is a graphical Role playing game creator.
❑ ^+ V856 PICTURE TOOLS Converts Pictures to other formats and styles.

❑ ^+ V858 MUSIC MAKERS A selection of programs to produce your own music productions. Make your own music.
❑ ^+ V859 AUDIO TOOLS (2) Sound and Audio production utilities.
❑ ^+ V861 3d DESIGNER Graphic production utilities including CLight, DKBTrace
❑ ^+ V865 IMAGE PROCESSORS Tools to perform wide variety of Image techniques
❑ ^+ V866 MANDEL EXPLORER (2) This is the best collection of Fractal Generating software utilities on the Amiga.
❑ ^+ V869 ANIMATION ASST (2) Will solve many of your animation problems. Includes ABridge, Players, DA, AnimTools
❑ ^+ V871 3d HELPER Are you starting out with 3d graphics. Just what you need
❑ ^+ V875 SPACE Help you study, identify the Stars & celestial objects.
❑ ^+ V876 SYSTEM TEST v4.1 Checks & reports on your computer
❑ ^+ V888 TRONI CAD v1.0 The best CAD program with power functions.
❑ ^+ V899 ABACKUP v3.88 A Powerful backup utility that may be used for HD backup & File Archiving. SysInfo
❑ ^* V900 BOOTJOB v1.0 Include functions to store, install, view or execute any bootblock. Can save BB as executable
❑ ^* V901 FIM v2.2 IntroMaker to create you own Intros. IFF imports
❑ ^+ V921 COMPUGRAPHIC FONTS Will work with DPaint v4.1, ProPage3, Page stream, Page setter & Work bench v2.x+, Workbench 3.x About 30 Fonts (3)
❑ ^+ V924 PLOT MAP v0.85 An extra disk for use with Draw Map v4.0+ Will allow use of the program with 512K RAM
❑ ^+ V925 SLAUGHTER CHEATS Selection of WB Hacks & Cheats
❑ ^+ V928 THE LITTLE OFFICE One of the best disks at the present time. Has a Word Processor and others
❑ ^+ V936 LETTERS & BOILERPLATE Letters for you to use as your own or cut & pause into a Word Processor
❑ ^+ V942 SCREEN BLANKERS A disk packed with screen blankers. Includes the Twilight Zone blanker along with 10 others
❑ ^+ V943 LYAPUNOVIA v1.5 Mind-boggingly colourful program that makes pictures from a mathematical formula. Now with AGA support
❑ ^+ V945 PROPAGE 3 ENHANCER Over 40 Genies for use with ProPage 3.0, including useful ones like Make Pie Chart. Also structured clipart for unique borders!
❑ ^* V946 SYSTEM OPTIMIZER KCommodity gives you memory meters. REorg will optimize hard / floppy disks for big speed increase. HDMem virtual memory. 2 Meg of HD space for 2Mb
❑ ^+ V947 GNUPLOT Is a command driven interactive function plotter. Creates stunning plot/graphs of mathematical functions. Requires a hard disk drive
❑ ^+ V948 INTUITION BASED BENCH-MARKS v6.0 Contains all the popular BMs like Sieve,Dhrystone,Savage,IMath & Matri
❑ ^+ V949 TESTS Contains all of the classic speed tests and system checks we could find. Includes CPU Speed, A full featured system diagnostic tool & more.
❑ ^+ V951 PROTECTION is a collection of utilities aimed to protect your data and protect autobooting HDs & Document File. Lock your data files with a password
❑ ^+ V952 x-BENCH v1.0 (2) Complete solution to the replacement Workbench. Contains LastHope, View, Virus Checker, Power packer & DCopy2
❑ ^+ V957 TACKS v1.2 Help you create self-booting animation disks.
❑ ^+ V958 CLUB LEAGUE Is a utility that will allows you to edit and keep track of your divisons/leaggue stats.
❑ ^+ V959 AMIGA_E v2.1b Specific compiler. E is a powerful and flexible procedural programming language
❑ ^* V962 SUPER KILLERS v3.0 (2) The latest Virus Killers like BootX v5.23b, Virus Checker v6.29 and VirusZ v3.07
❑ ^* V976 WB v2.04 UTILITIES 6 Next collection of WB v2.04+ utilities.
❑ ^+ V977 FILE & HD No 5-6 Next Excellent collect of HD utilities. (2)
❑ ^+ V979 NCOMM v3.0 Is a communications program based on Comm v1.34 with lots of very nice enhancements
❑ ^* V980 KICK v1.3 Will down grade A500+, A600, A1200 users machines to run software that would NOT normaly work. Turns them into a Workbench 1.3.
❑ ^+ V983 MEGA CHEATS v3.0c Now contains over 500 cheats.
❑ ^+ V984 PROTRACKER v3.0a The latest updated version from Norway, Various bugs fixed and 70 new features
❑ ^+ V988 ZIPBENCH v4.0 Another Workbench replacemant but contains excellent utilities like, powerpacker v2.2a, powerplayer, SysInfo, VirusX, Archiver, b-Base, BootIntro, Degrader, Fist Aid Box (2)
❑ ^+ V994 THE MONEY PROGRAM v1.5 Features include upto a maxium of 60 accounts, upto 50 direct paymenys,
❑ ^+ V1000 GRAPHPRO v1.0 Written with Amos pro by David Jordan. Basically takes a set of data, plots them on a graph.
❑ ^+ V1001 VMORPH v2.21 Will allow you to create smooth morphs/warps between two different images over a period of frames to create an animation.
❑ ^+ V1002 RAMOS PRO v1.12 If you have Amos Pro then this disk will make your programs Boot without the program
❑ ^* V1003 NICKPREFS Is an enhancement to WB 2/3 which adds 3 new preferences WBPicture, BuzyPionter & Floppy.
❑ ^^ V1005 WORKBENCH 3.0 UTLS Contains the fist batch of A1200 and A4000/030/040 Utility programs
❑ ^+ V1009 TURBO TEXT v1.1 Excellent Word Processor. Very impressiveversion
❑ ^+ V1013 POOLS PREDICTION A helping hand with the Pools.
❑ ^+ V1016 OCTAMED v2.0 Music editor which was designed for making music.
❑ ^* V1017 POST v1.86 An excellent Postscript interpreter for the Amiga which implements the full Adobe language (3)
❑ ^^ V1021 (AGA) SCREENS Enhance your Workbench disks backgrounds with theses nice full coloured pictures

❑ ^+ V1022 LITTLE TRAVELLER v1.1 Shows a world map & you can select any country for travel information, Zooms up another close up map with more detail.
❑ ^+ V1023 QUIZ Contains Questions & Answers with the option to add
❑ ^^ V1024 (AGA) MANDELSQUARE v1.6 Generate enhanced AGA set images, requires numerical coprocessor. You can create 256 colour coloured pictures
❑ ^* V1025 TERM v3.4 Comm prgroam, Xpr transfer, filetype ident after download, cut & paste, point-and-click, auto upload/ download, VT102/VT220, Ansi emulation, powerfull phone book & AGA support (3)
❑ ^* V1034 ADM v1.01 Flexible address database with loads of great features.
❑ ^+ V1035 FES BASIC Just in time for all the new machines which do not have Basic with thier machines any more.
❑ ^^ V1037 (AGA) A1200 WB HACKS An excellent collection of Utilities & Hacks
❑ ^+ V1038 AMOS PRO UPDATER v1.11 1st Update to the Amos Professional
❑ ^^ V1039 (AGA) WB3.0 INSTALL If you need to install your A1200 HD then you need this. Also requires disk V1075
❑ ^+ V1040 bBASEIII v1.3 An easy to use, versalite, yet full featured database. Greatly enhanced successor to bBASE II.
❑ ^+ V1041 DIGITAIL BREADBOARD Full featured digitall circuit simulator
❑ ^* V1043 SUPER DARK v1.5 A screen blanker like After dark from the MAC theres about 30 blankers.
❑ ^+ V1044 FANCY PRINTING Banner, Graph Paper v1.2 and Disk Print v3.59.
❑ ^+ V1045 uDRAW v1.0 Provides a mechanism for the rabid drawing of schematic diagrams. Bitmap oriented
❑ ^+ V1046 THE XI RAVE SAMPLES Grarett Watt's IFF 808 State samples
❑ ^+ V1048 HAM-8 VISTAS (2) Collection of Ham-8 Vista drawings
❑ ^+ V1051 EASY CALC v1.0 A spread sheet designed to be both easy to use and fast. Built in excellent help system.
❑ ^+ V1054 ADVANCED UTLS 2 Compress Disk doubles the capacity of your D on the fly with compressions Also DiskOptimizer, SCSI Mount and more.
❑ ^* V1055 PARBENCH All the software you need to hookup 2 Amiga's or CDTV's.
❑ ^+ V1056 DEVELOPER Contains the official Commodore developers Kit for the Amiga Guide & install utilities.
❑ ^+ V1057 EDPLAYER Music MOD player that looks, acts & plays like a CD
❑ ^+ V1058 3D GRAPHICS Several 3d moddeling/ray tracing programs
❑ ^+ V1059 GRAPHICS Create stunning graphical images. MPath creates swirling galaxy images. Roses, Rayshade
❑ ^+ V1060 CIRCUIT BOARD DESIGN Includes mCAD v1.26 and several terrific routines for the electronic enthusiast.
❑ ^+ V1061 DISK UTLS Several highly recommended programs for performing file hard drive backup, file recovery, disk track recovery, and forced disk validatuion
❑ ^+ V1062 DESKTOP PUBTransfers Macintosh screen fonts .AFM metric files to Amiga fonts/PPage .metric files.
❑ ^+ V1063 RIPPERS, STRIPPERS & BEATS For the music enthusiast, designed to strip music from your favorite games
❑ ^+ V1067 3D OBJECTS 3 About 20 objects in Sculpt / Turbosilver format
❑ ^+ V1069 PRINTER DRIVERS 5 Desk-jet 550c, 500, 500c, Ricoh HP1200, Canon BJ300, 130, LPB, 10e, PJ1080a HP Paintjet.
❑ ^^ V1070 (AGA) UTLs 2 256 colour icon editor,Plamsa256,QuickGrab v1.1
❑ ^^ V1071 (AGA) MSM v1.8 Martins system monitor for programmers
❑ ^^ V1072 (AGA) WINBLENDER v39.28 Create excellent/stunning AGA fractals. Also contains 68030/040/FPU versions.
❑ ^+ V1073 FT-X ACCOUNTS v2.01 Was written as there are not ready any other good account packages.
❑ ^^ V1074 (AGA) UTLs 3 Collection of AGA Based utilities. Includes Kill AGA Which allows you to run old badly written programs incluing demos & some games
❑ ^* V1077 GENEALOGIST v3.04 Is a specialized database for keeping track of genealogical information. Full featured & a wide selection of features to use.
❑ ^+ V1078 PC TASK v2.03 Software IBM-PC emulator. It allows you to run the majority of PC software with no additional hardware. Now supports VGA, EGA, CGA and MDA. This is a demostration version.
❑ ^+ V1079 KEYBOARD TRAINER v1.1 Best Public Domain Typing Tutor An excellent New program / Amiga
❑ ^+ V1081 REPAIR-IT 3 Contains a selection of Disk, Hard Drive repairing and file saving utilities for the Amiga.
❑ ^+ V1083 CROSS v5.1 Is a program that creates crossword puzzles for you
❑ ^+ V1084 SPECTRUM EMULATOR v1.7 (2) This is the best & latest version of the most popular emulator for the Amiga. There is an 020/030 versions now on the disk which enhance the games on disk.
❑ ^+ V1087 STOCK ANALYST Technical analysis and securities tracking program which calculate when to buy & sell shares
❑ ^* V1088 WB 2.0+ UTLS Contains ChkFrag, DFC5, FastDos, Formatter, No-Click, UnDelete, KeyMac, MegaWB, MR, 1 Plane, OpenL, ResumeMaker & StarBlank.
❑ ^+ V1089 STATRAM Recoverable RAM based on VD0 but 5 times faster.
❑ ^^ V1090 ANDYS (AGA) UTLs Another selection of utilities for A1200 owners also encludes FakeMem, KillAGA, AGATest, Degrader and much more.
❑ ^+ V1091 ASTRONOMY v2.0 A menu driven astronomy program that calculatoes information about the Sun,Moon, Planets and Constellations. Help Disk
❑ ^+ V1092 HEROQUEST AID Will aid solo AD&D players who do not have a Dungeon master at the present time. It takes over the DMs role. Good or what.
❑ ^+ V1093 PARNET SET-UP (2) A two way network file system between two parallel ports, establish via two amigas
❑ ^* V1095 DEGRADERS If you have trouble running software on an A1200 or A4000/030/040 give this disk a try it will emulate the basic 1.3 rom better that any other software on the Amiga at present.
❑ ^+ V1096 MING SHU CHINESE ASTROLOGY Will create a horoscope in seconds not hours. the complete aid.
❑ ^+ V1097 TITANIC CHEATS v1.40 Contains 950k of raw data which is just a whisker under 600 games.Well presented
❑ ^+ V1101 RJ UTLs This disk contains helpful image processing and painting programs. Like Perfect Paint v1.34, Image Workshop v1.3, an IFF Manipulator.
❑ ! * V1102 DT UTLs Contains Border for WB v2.04+ machines, MakeKickFile, SKick v3.34, is a replacement for kick-it, Z Kick and LKick kickers. It will softkick any other version of kickstart into rom.
❑ ^+ V1103 TEK-ATAK MODULES An excellent helping of wonderful music for your own productions or for to listen to.
❑ ^* V1104 COLOURED ICONS Transfer your disks into colouful well presented works of art with this database.
❑ ^+ V1105 VIEW TOOLS Contains Convert, ViewTree, a Famill tree easy to use database progra. ViewPhone, an Britsh telephone storage database. ViewDisk, is a small disk catalogue utility.
❑ ^+ V1106 MAJOR LEAGUE Allows you to keep track of your favorite teams and there results. DataIndex v2.4
❑ ^+ V1107 BLITZ BASIC2 Comprises of a fully integrated editor/compiler enviroment for the serious Amiga programmer
❑ ^+ V1109 STAR VIEW Is designed to show graphicallythe positions of the stars and planets from any point on Earth.
❑ ^+ V1110 FORCASTER v2.01b Is a Horse Racing prediction program which uses statistical analysis of Major factors.
❑ ^+ V1112 CHEQUE BOOK v2.5 Record your bank and other transactions.
❑ ^+ V1114 PRINT LABELs DocDump2.1, Envelope Print v1.2, Inlay Maker v1.4, MC master v1.1, Banner Press, Label Print v3.5
❑ ^+ V1116 POOLS WIZARD JNR Deadacated Amiga Football Pools predicter.
❑ ^+ V1117 x-BEAT v1.2 A good program for drum sequencing 16 bass.
❑ ^+ V1119 MUSIC BASE v1.0 A versatile a east to use musical database.
❑ ^* V1121 SHAYERA'S TOOLS Contains IFF2RAW, MatchRun, NoClick, PlayMelon, SetStar, TrackPlayer v1.92
❑ ^+ V1123 DIGITAL DREAMS UTLs Contains Trax, ProMax, trax Map, Titans cruncher, Protect, VC, Scrabble II, Boot Block Champ II and File Protect.
❑ ^+ V1124 FIRST ALERT VIRUS BootX, EVN v2.22, LVD v1.75, MVK v2.2, No Saddam, SnapShot, VC, Virus X, Virus Z.
❑ ^+ V1125 LEMMINGS 2 INSTALL This disk will install Lemmings 2 to your hard drive. 1Mb Chip RAM + 512k RAM
❑ ^+ V1129 RED DRAWF TRIVIA The ultimate Quiz and answers game.
❑ ^+ V1130 COMMUNICATE v1.2 A helping tool for learning one of the eight formats of communications or languages
❑ ^+ V1131 COPPIERS UNLIMITED AContains DCopy, FastEm, FastLighning, Maverick, Mirror, Nib, Rattle, Raw, Sanity, Super Duper and Tetracopy.
❑ ^+ V1133 NUMPAD v37.3 Emulates a numeric keypad on some Amiga Keys.
❑ ^* V1134 TOOLMANAGER v2.1 (2) Includes the ability to add menus to your Tools menu. add WB icons or Windows.
❑ ^* V1136 DISK UTLs 2 Copy_C A tool for making backup copies, formatting ect. DiskMate A multi drivedisk copier. Disk Salv 2 Disk repair, salvage & undelete utl. HDClick, HD menu & workbench tool.
❑ ^^ V1137 (AGA) UTLs 4 Test, BBlank, CheckAGA, CycletoMenu, Doublex, Force VGA, GIF Datatype, PKLudge, PPShow, Rend24, ViewTek & Verlauf
❑ ^^ V1138 (AGA) UTLs 5 Degrader, Pov-Ray, AmigaToDouble, CardMemLast, Palette, Promotor, RomTagMem.
❑ ^^ V1139 (AGA) UTLs 6 A4091Patch, Alert Timer, Bestid, Clouds, Ham8 JPEG, NewPOP, NTSC4NTSC, PatchPointer, Plasma PCX & Screen Mode changer.
❑ ^+ V1140 FOOTBALL FORECAST This is the latest and most upto date football results prediction program.
❑ ^+ V1141 MANDELPLOT v2.4 Does't just produce 2d fractals, can view them in 2d or 3d modes, make animations, even design your own fractals. Fastest mandelbrot producer (5 seconds on an A500).
❑ ^+ V1144 GRAPHICS Contains JPEG files,DJPEGGui v37.1,MakeAnim7,BestAGA anim playback. S-Anim-5 v1.1, S-PIC v1.2
❑ ^+ V1145 MENUMASTER III If you want to produce a simple menu system this is it wether for a hardsk or floppy disk
❑ ^+ V1146 C64GFX v1.2 Is used to convert C64 Graphic files to Amiga.
❑ ^+ V1147 EASYBENCH Contains a wide selection of utilities which covers almost all the best utilities on the Amiga (2)
❑ ^+ V1152 GOLDED V.94 (2) A GUI Based editor with lots of functions/options (about 250), DICE compiler front end, OS3 look & functions, folding paragraphs, fully customizable menus, Hotkeys, Autobackup, Insert columns, Clipboard, And more.
❑ ^+ V1153 AMIGABASE v1.31 A programmable database, features include 2 display methods, filter datatypes, search, print, string, memo text, date, time, Data only limited by memory size.
❑ ^+ V1154 MAGIC MENU V1.27 Replaces all Intuition menus, supporting both pull-down and Pop-Up menus. Menus can be displayed in a 3d look.

❑ ^+ V1155 PHXASS v3.3 A complete macro assembler which supports all important Motorola processors.
❑ ^+ V1156 VIDEO TITLER Can you generate professional looking TV titles and credits for you own videos. Well you can with this, It has outstanding abilities like very smooth scrolling, colour slides (AGA support) and use of colour fonts. ideal for use with our Colour Fletcher fonts
❑ ^+ V1157 DINOWARP TRIVIA You land suddenly & apear in front of a Dinosaur who agres to let you go if you answer 50 questions
❑ ^+ V1158 BACK TO SCHOOL Is a collection of the best Public Domain & shareware educational programs which will demostrate to the youngest kid how to learn on the computer whill having fun. (2)
❑ ^+ V1160 NOSTROMO CHEATS v1.1 The best adventure solution disk ever made with over 500 arcade cheats.
❑ ^+ V1161 GOALKEEPER v1.0 A computer soccer administration program, Create your own Mini Football leagues upto eight teams, Fit for the European, UK leagues. or just use with Kick-Off 2.

AMIGA GAMES

❑ ! - 1073 TETRIS ORIGINALThis is the closest game to the original tetris
❑ ^+ 1420 DTRIS If you want a1 or 2 player Tetris this has to be 1 of them.
❑ ^+ 1749 SCRAMBLE Original that old classic game from the arcades
❑ ^+ 1977 POM POM GUNNER Shoot down world wor II air planes in this Operation Wolf style type game.
❑ ! - 2018 JETMAN Spectrum classic conve-rted to the amiga, with all the original sounds.
❑ ^+ 2022 SEA LANCE The first Silent Service type sub war game on PD
❑ ^+ 2054 ATIC ATAC A rendition of the game from the original Spectrum
❑ ^+ 2164 DUNGEON ON NADROJ This is the best D&D adventure type game.
❑ ^+ 2220 STRATEGIC GAMES Eternal Rome, Lords of Hosts, In Moonshine.
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❑ ^+ 2280 DIPLOMACY Classic strategy game loosely based on World War 1. 2Mb
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❑ ^+ 2432 GOLDEN OLDIES Galoga, Galaxian, Space invaders, Asteriods, Batty & Missle Command
❑ ^+> 2447 COINDROP Fruit Machine simulator with various gamble modes.
❑ ! - 2448 CRAZY SUE Another first rate cute school girl platform game.
❑ ^+> 2480 FRUIT MACHINE 2 As near as poss to the Arcade machines
❑ ^+ 2485 IRON CLADS Strategic War Game which is heavy on your mind (2)
❑ ^+ 2491 LEGEND OF LOTHIAN v1.02 Excellent adv game in the vein of Ultima.
❑ ^+ 2498 AMOS CRICKET Excellent arcade cricket simulator with nice graphic
❑ ^+ 2614 TETREN is a 1 or 2 player Tetris. The 2 player game is Head 2 Head.
❑ ^+ 2617 GOLDEN OLDIES 2: Croak, is a 1 or 2 player Frogger. BiPlanes is 1 of the most additive games we've played here. Trail-Blazer, as the C64 Classic. Scamble.
❑ ^+ 2620 DR MARIO You must move coloured pills down the screen. 3 in a row
❑ ^+ 2621 ETERNAL ROME Start the Roman Empire from 32BC. Build fleets, armies & attack
❑ ^+ 2622 DONKEY KONG Platform game in which you must rescue the girl.
❑ ^+ 2676 MORIA v5.4 Loads of new features, better graphics, larger, graphics, dungeons, screen updates, overview of dungon's map, more monsters ect..
❑ ^+ 2710 CLASH OF THE EMPIRES (2) v2.1 Strategical War game By T.A.Sear
❑ ^+ 2724 NEIGHBOURS Is the best graphical adventure game to date (2)
❑ ^+ 2738 AIR TRAFFIC CONTROL Try to guide upto 100 planes into the AirPort
❑ ^+ 2775 ROULETE ROYAL Why not do some gamble with chips at the casio
❑ ! + 2802 CARD-O-RAMA Sea heven, Crib Klondike, Black-jack, Spades, Street .
❑ ^+ 2825 ALL ROUNDER A Cricket simulation with great graphics & play
❑ ^+ 2842 CRAZY SUE II Sequal to the all time best selling PD platform game.
❑ ^+ 2854 SPACE INVAIDERS II A revised old classic Space Invaiders game.
❑ ^+ 2863 FIGHTING WARRIORS A karate combat fighting contest game.
❑ ^+ 2932 NUMERIX Enjoy puzzles / Tetris then this is a must. You have a scrabble board & you must place tetris blocks to get points.
❑ ^+ 2941 EXTREME VIOLENCE Scrolls around much bigger than Smash TV
❑ ^+ 2987 BOMB JACKY A conversion as the original Bomb Jack, it's as the best
❑ ^* 2988 BALDERS GROVE its here Boulder dash with a selection of levels that work fully on Workbench 2. or higher
❑ ^^ 3023 UCHESS (AGA) Do you love chess then try this. 4Mb & WB 3.0
❑ ^+ 3037 SSW A game for 2 based on Space Wars but with many extra features.
❑ ^+ 3038 TANK HUNTER A 2 player Tank Attack game with various levels
❑ ^+ 3039 ASTEROIDS II v0.85 The best version of Asteroids i have ever seen, If you like Asteroids then this is for you.
❑ ^^ 3040 TETRIS (AGA) If you like tetris, you need this disk. AGA graphics.
❑ ^+ 3075 18 HOLE GOLF (2) The first excellent golf game.Theres fully selectable speed & power functions combined with surpub graphics top a great game.
❑ ^+ 3162 SON OF BLAGGER This is a classic C64 platform conversion Can you remember how active it is to play
❑ ^+ 3214 UNIV CONQ A strategy game where 2 human players battle for control of the universe. Status information is continually updated to allow the player to concentrate on strategy. digitized pictures

❑ ^+ 3234 SYSTEM DEFENDER If Defender is the name of the game then this is the game for you, in true defender style it retains all features.
❑ ^ +3235 ALIEN BASH The game is set inside a prison for the galaxys mentally unstable, you have been imprisoned there along with a bunch of your mates. Rescue your friends by shooting
❑ ^ +3237 SKIDMARKS Racing game in which you skid around a nice track to win
❑ ^+ 3252 BONDMINE 12 A well produced game in the vain of the classic Boulder Dash games.
❑ ^+ 3253 OPERATION METEOR This game is set in 3d graphics in which you must travel around traped in this graphic stunning adventure.
❑ ^- 3257 SUITCASE (2) The best adventure on the amiga to date. Excellent
❑ ^+ 3265 WIBBLE WORLD GIGGY Wibble World of Giggia Mainia hits town Yes you can enjoy the trills of controlling an egg shaped character for free. Solve puzzles avoid the monsters
❑ ^+ 3269 BRAINBOW is an original board game, which will have you taxing your brains for hours. Rather like a version of the pile-up Scrabble
❑ ^+ 3280 STRIKEBALL Is a version of baseball with a few rule changes. When the game commences you will see a normalbaseball pitch & players positioned as inbaseball.
❑ ^+ 3283 NECESSARY ROUGHNESS (2) Puts you in charge of a team of your choise and lets you play a computer team, again of your choise. As headcoach you will have to call the playsthat you think will be most effective to the game. You will then be ableto see the action, followed by a breif summary of what you have just seen.
❑ ^+ 3285 THE ENTITY v1.1 You play the role or i should say control the stix and you're beinginvaided by the Entity. You are enclosed inside an electrofield which mustnot be touch.
❑ ^+ 3286 AIR HOCKEY Is a bat and ball game based on air hockey from the amusement aracdes.Its a basic game for 2 players.
❑ ^* 3287 ROAD TO HELL (2Mb) Is an overhead view driving game like HotRod and super sprint. It requires skill and coordination for success. The aim of the aim of the game is towin the gold in the Championship by making more money that your opponent. Theres a helping extra which can be bought from the shop like enhancedtypes, Better Engines, Rockets, Smoke screens act.
❑ ^+ 3310 STARBASE 13 (2) Is a graphical adventure, simular in style to monkey island or Operation Stealth. The controls and what they do are fairlty obvious.

POPULAR IBM PC PD + SHAREWARE

❑ PCV100 GRAPHIC WORKSHOP (2) Is a program for working with computer bitmapped grapgic files. It will handle most of the popular formats. Which version. ❑ DOS version ❑ Windows 3.x version
❑ PCV329 ENVISION PUBLISHER VGA v1.52 Is a full featured desktop publishing program. EVP is a powerful DTP program with graphical user interface, mouse support, WYSIWYG operation, scalable fonts, full object drawing.
❑ PCG339 WORLD EMPIRE II DELUX This is the Windows version of the game World Empire which is based on the game RISk, but with other features such as internal revolutions and country ideologies. This new version features 139 real world countries to conquer, different maps for each section of the world will be displayed on the monitor. Your objective is to conquer the entire world and bring it under your own ideology. Requires Windows3.x,2Mb, HD

STAR TREK + SI-FI

❑ ^ + ... AT05 KLINGON D7 CRUISER fires torpedoes while passing by.NCC-1864
❑ ^ + ... AT10 ENTERPRICES Leaves the Star station dock. NCC 1701-A classic original
❑ ^ + ... AT22 APPROACHING VESSELS
❑ ^ + ... AT23 STAR TREK FLEET MANEUVER
❑ ^ + ... AT33 THE PROBE II & BRID OF PREY
❑ ^ + ... AT34 LEAVING SPACE OFFICE Docking, Attack mode, Bird of Prey Scout attacking.
❑ ^ + ... 1060 STAR TREK *: TNG Game
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❑ ^ + ... 2222 STAR TREK TNG This is the latest quiz game based on the T.N.G (2)
❑ ! - .... 2501 STARTREK / Jimbo Barber (2) 2dd
❑ ^ + ... 2503 STARTREK Eric Gustafscn (3) 2dd
❑ ^ + ... 2926 STAR TREK THEMES! (2) The original sampled version of the Star Trek themes.
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❑ ^ + ... 3108 STAR TREK: DEEP SPACE 9 SLIDES

❑ **Star Trek / Wars Video Tape 25Min long Tobias Richter 24bit ray traced animation which took 6 weeks to produce. (VHS Format) £11.99 ***

Code Numbers

+	Works with Workbench 2.0
*	Workbench 2.0+ Only
^	Works with Workbench 3.0
^^	Workbench 3.0+ Only
>	Not A600 Machines
-	Not A500 or A600 Machines
!	Not Workbench 3.0
??	Requires ?? Amount of disks
??Mb	Requires ?? Amount of memory

NEW DEMOS

❑ ^+	3366	SOME DEMO / LEMON
❑ !+	3338	AQUARIUM MEGA DEMO
❑ ^+	3354	FAIRLIGHT RAVE DEMO
❑ ^+	3290	GRAPEVINE 16 (3) £4.00
❑ ^^	3212	(AGA) NIGHT BREED SLIDES (2)
❑ ^+	3136	KEFRENS DESERT DREAM (2)
❑ ^+	3139	SCOOPEX 2 UNLIMITED (2)
❑ ^^	3063	(AGA) HOIS MEGA DEMO
❑ ^+	2921	STATE OF THE ARTS
❑ ^*	2815	LAWNMOWER MAN (2)
❑ ^+	2858	JESUS ON E'S / LSD (2)

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NEW! CD4: Aminet CDROM Just For 1993 (£24.99 + £1.00 P&P) Released!

The Aminet CDROM contains thousands of Amiga programs from the Aminet Internet Archive. This disc contains nearly 600 megabytes of software. The thousands of applications include GNU programs such as the GNU ANSI C/C++ compiler, the GDB symbolic debugger, GNU Emacs, the Ghostscript previwer, and GNU Chess. There is a huge selection of sound files, and utilities to play them, including Noisetracker and MED modules. This disc contains hundreds of games, including educational games, video and arcade games, strategy games, war games, card games, and word games. The disk contains many modem communication programs and BBS software. The Aminet CDROM is in ISO-9960 format, so you can read this disc from nearly any system, including Amiga and IBM PC, BBS index files are included for popular MSDOS BBS's. This disc is brand new in 1993. Also includes Workbench 2 and Workbench 3.0 sections. Full of software & shareware.

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continued from page 104

calculation for modem users; hot keys (with many, such as a new Shell, pre-defined); a screen dimmer; a mouse accelerator; Revision Control System; and lots, lots more. It's all easily configurable via a Preferences editor, and can even be controlled by ARexx (if you've been following our series, of course...). The documentation comes in AmigaGuide or plain ASCII format, and the actual archive has an Installer front-end so you don't need to do any work, other than the occasional mouse-click, to get the whole thing up and running.

I've said it before about collections of Commodities, but I do believe that this is the ultimate one – get hold of *KCommodity* and you'll never need another one in your Amiga-owning life, probably. Highly recommended.

Program rating: 10/10

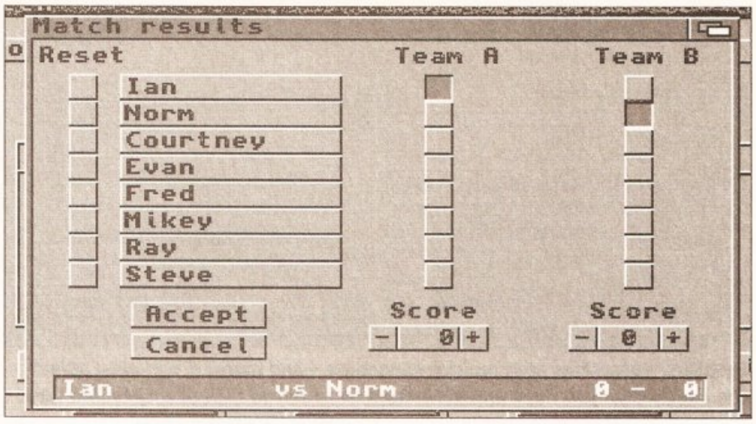
GOALKEEPER

Fish disk 886

GoalKeeper is a simple, useful program which keeps track of a league of up to eight soccer teams or players. The author wrote it because of arguments when playing *Kick Off 2* and *Sensible Soccer*, but it can be used to keep the results for any league with up to eight teams.

Data entry is simple: just enter the two scores (there are "+" and "–" buttons as well as an area to actually type the number, so the whole thing can be done without touching the keyboard) and the league table is automatically updated. It gives full information – played, won, drawn, lost, points, goals for and goals against – and in an admirably Euro spirit there's the choice of whether a win is awarded three points (the UK) or two (everywhere else).

My only real complaint is that each time a score is entered, you're taken back to the screen displaying the league table, which is a pain if you've got more than a couple of results to enter. Oh, and you can't print the table out – although since there are a maximum of eight teams, it wouldn't be too much of a chore to



If you've always wished for a program to keep track of your eight-team football league, you'll find GoalKeeper's results entry simple and efficient.

transcribe the details by hand.

All in all, *GoalKeeper* is a neat little program which will no doubt find many uses in pub quizzes, junior football leagues and the like. And, of course, it will inevitably be used by those degenerates who use their Amigas to play – gasp! – football games!

Program rating: 8/10

TEXTPORT

Fish disk 886

This is a set of four utilities for people who have to convert text files between Unix or MS-DOS and the Amiga. They are:

- *AddCR* – Converts Unix or AmigaDOS text files to MS-DOS format by adding a carriage return at the end of each line.
- *StripCR* – Works in reverse, taking out the carriage returns and so converting MS-DOS files to Unix or AmigaDOS format.
- *StripHR* – takes out hard returns at the end of each line, while leaving paragraph formatting intact, which is useful if you have word processing documents which have been saved in this format (they're the bane of our Production Editor's life!).
- *Reformat* – re-wraps a text file to a new length by taking out the original carriage returns and replacing them at a specified position along the line.

That's about all that you can say about these utilities, really; they're fairly easy to write, but if you don't have the programming knowledge (or the time) and you do have files that need to be converted, then they should work just fine.

Program rating: 7/10

CFN

Fish disk 888

CFN is a Shell utility written by a frustrated Unix programmer. Frustrated, because Unix systems have a neat little feature whereby hitting the Tab key in the middle of a filename will complete that filename automatically. If two or more names are similar, it completes as much as it can, and waits for you to enter the final characters. This is a great idea, and one that the Amiga is sorely lacking – until now.

CFN (short for Complete the FileName) is invoked whenever you create a new Shell (you have to edit a couple of lines in files in the **S:** directory to make everything work), and works flawlessly. It's not the sort of program that will shake the world, but it's certainly worth having – especially if, like me, you tend to give files and directories long, meaningful names and then get so fed up typing the whole thing in every time that you change the name to something short and cryptic instead.

Program rating: 9/10

NEWLIST

Fish disk 888

This Shell utility is described as "The ultimate 'ls'." And, judging by the documentation, it certainly is – there are well over 40 different flags that you can give the command, to do everything from colour different parts of the information to recursively list sub-directories. "Features include," it says, "links, networking, Envoy, mufs, assign adds, datatypes, a pager, complete output formatting, various recursions, and all the sorts and filters a person will ever need."

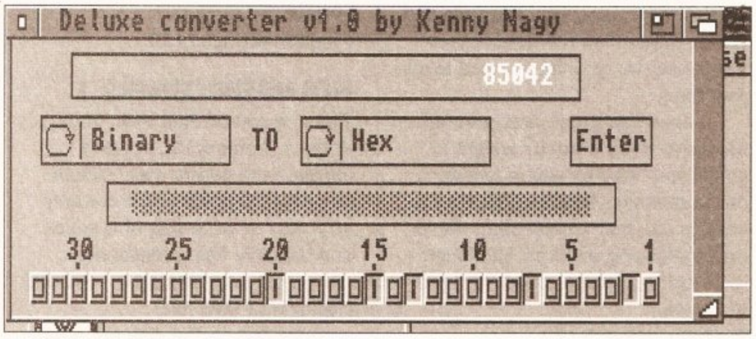
Why am I quoting the documentation, rather than telling you how it actually performed? Because, frankly, I need none of the above – and, I'm pretty convinced, neither do 99% of other Amiga users. I'm quite happy with **Dir** and **List** – all I want to know is what's in a directory, for goodness' sake! And when a **Dir** replacement comes not as a single file that you drop into your **C:** directory, but instead a whole Install package with warnings about replacing dozens of configuration files if you're using an older version of the program, it's time to start wondering whether you really need to clutter up your hard drive with such a program. Me, I don't.

Program rating: 5/10

DELUXE CONVERTER

Fish disk 889

Want to change binary to hex? ASCII to an integer? *Deluxe Converter* does the job for you. On the input side, it can deal with binary, hex, ULONG integers, ASCII and RAWKEY data, and will convert any of these into binary, hex, a ULONG integer or ASCII. A neat little twist is that you can enter binary by clicking on small buttons, rather than having to type the number in by hand – something that's easy to get wrong when you've got a 20- or 30-digit binary number to convert.



Deluxe Converter: for all your binary to hexadecimal needs! More input options and output types than any normal person would want in two lifetimes.

If you need to convert numbers between any of these types, *Deluxe Converter* does the job just as well as anything else I've seen. But if you do need this facility, you've probably already got a scientific calculator that does the job for you anyway.

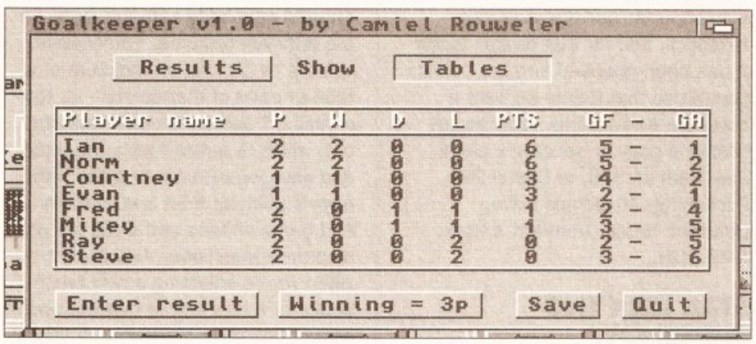
Program rating: 7/10

DROPBOX

Fish disk 890

Now here's a useful program. *DropBox* is a Commodity which enables you to automate things like expanding file archives simply by dragging and dropping their icons.

When launched, the program



More of an armchair sportsman than a football league type? GoalKeeper still has something for you: use it to record all your Kick Off 2 scores for posterity!

puts an AppIcon on to your Workbench. If you double-click on this, you'll find that you get a list of the already-installed "translators", and the option to add more of your own. This is easy to do, as long as you know the basic syntax of whatever command you want to use. For example, if you want to use *LhA* to decompress any archives that you drag to the AppIcon, and put the resulting expanded files in the **RAM:** drive, you select the destination as **RAM:**, the command as **lha,** and the template as **[COM] e [SOURCE] [DEST].** Finally, set the pattern to **#?.lha.** That's all there is to it; you're telling the program that whenever you drop a file which ends in **.lha** on to the AppIcon, it should run *LhA* and give it the command **e,** together with the source file's name and the destination **RAM:**. Simple!

Of course, *DropBox* isn't limited to just decompressing archives; it will work with any **C:** command, and there are options to open a window for output, or one for input, if the command requires it. In this way, you could use *DropBox* to compress files, display them using your favourite text viewer rather than the default that they're set to, or whatever else takes your fancy.

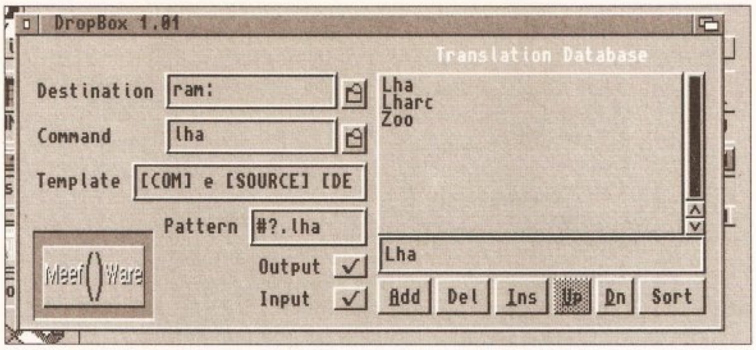
A useful program, and one that will prove to be worth its weight in gold if you find that you're forever decompressing files. Indeed, it's so easy to use that it even beats *All* for decompressing archives! (Although *All* is still my compression front-end of choice.)

Program rating: 9/10

DISKODE

From most PD houses

Diskode is a disk copier with a difference – it encrypts your disks as they're being copied, so that no-one can read their contents without the correct password. In fact, to decode the disk it must be copied on to another floppy, at which point the program will automatically decode the data and write it in its original format. There's no need to select whether to encode or decode a disk – it's done automatically by the program, which looks at the inserted disk and determines whether it is already encrypted or not.



DropBox: automates your archive expansion – and more! It can even select the destination you have predetermined for archived files of a specified type.

This version of *Diskode* is freeware, although a forthcoming release, entitled *Diskode Pro,* won't be – but then, it will have a range of extra features such as allowing data to be read directly from an encrypted disk without the need to copy the whole thing to another floppy. Until then, this is a useful program for anyone who's security conscious – copy all your sensitive data to a floppy, encode that floppy to another one using *Diskode* and destroy the original.

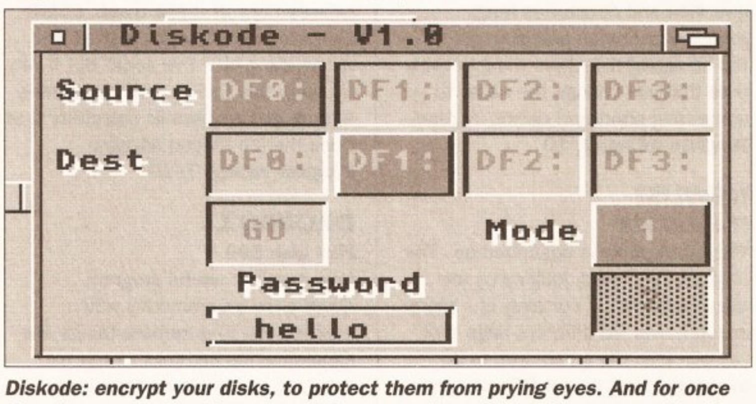
Program rating: 7/10

HOLMESBROTHERS 1

This is a compilation disk, from Holmes Brothers PD, created because the author was "sick of receiving PD disks which are only 10% full." It's the first of a series, and certainly has a reasonable number of programs on it – the disk clocks in at 96% full.

Included on the disk are a wide range of different programs, from games through utilities to a home accounts package (groan). Some highlights include:

- *Degrader* – tries to persuade older programs to work on new Amigas.
- *Numpad* – fools the Amiga 600 into thinking that it has a numeric keypad (some programs require one)
- *Turbo Mandel* – a fast fractal generator
- *Virus Checker* – one of the most popular anti-viral utilities
- *SysInfo* – full details on your Amiga
- *AGraph* – draw bar, line, area and pie charts
- *Pyro* – a screen saver
- Archivers – *LhA* and *UnARJ* (between them, they should cope with just about all the compression techniques you're likely to come across).



Diskode: encrypt your disks, to protect them from prying eyes. And for once there's no way of getting around the encryption without the program itself.

This is an excellent compilation; it's always nice to see someone putting together a useful range of programs and actually filling a disk, rather than leaving half of it empty. The disk costs £2, and can be ordered by phoning Craig Holmes on ☎ 0902 733418, or by writing to 23 Rocester Avenue, Wednesfield, Wolverhampton, West Midlands WV11 3AU.

Value for money: 10/10

DIGITAL DISK ISSUE 2

I looked at the first issue of *Digital Disk* last issue, and was quite impressed. It's a disk magazine that is being created simultaneously on three formats – PC, Atari and Amiga – so with luck it should have some interesting debate in the future, as people start writing in. Now, since this is still very much a startup project, there hasn't been much in the way of reader input since the first edition. However, the editors haven't been idle; the front-end has been completely re-written, and is now excellent and very easy to use. All the guys need now are some subscriptions and some reader feedback, and for that reason issue 2 has been released into the public domain so that it gets as wide a coverage as possible. You can get hold of a copy by sending a blank disk, with an SAE, to Digital Disk Publishing, 70 Donald Drive, Chadwell Heath, Romford, Essex RM6 5DU.

STAR TREK TNG SLIDESHOW

Magnetic Fields disk SS042

"Star Trekkin', across the universe / On the good ship Enterprise, under Captain Kirk...". Ah, what a marvellous song that was. This is a slideshow of images from *Star Trek: The Next Generation,* which will no doubt have Trekkies reaching for their phasers (sorry, wallets) immediately. The images are decent quality, and there are a reasonable number of them on the disk, although the slideshow only takes about a minute and a half – there's hardly any pause between images.

I'm not really sure who buys these slideshow things. And especially who wants pictures of such an incredibly dull program as *Star Trek TNG.* Still, if a digitised Whoopi Goldberg or Will Wheaton will make your day, these are as good quality as any I've seen. Just remember: Ye canna break the laws of physics, captain.

Value for money: 6/10

KIDSPAINT

Magnetic Fields disk ED020

There seem to be a few "painting for small children" packages appearing at the moment. This one has the advantage that the user interface is fairly nice (although I can't screengrab it to show you – it refuses to co-operate with anything I've got), but the disadvantage that it's rather slow.



Star Trek: The Next Generation. "It's a disk, Jim, but not as we know it." (Editor's note: yes, we know that that has nothing to do with The Next Generation. But there's nothing like the classics, is there?)

Most of the screen is taken up with the paint area, but around the top and right-hand side are icons for the different features. You choose colours by clicking on a picture of a tube of paint of that colour – its top comes off and a little paint squirts out, which is a nice touch. You load and save via pictures of disks with arrows pointing from and to them, and brush shapes and sizes are all displayed graphically. However, it's when you're selecting a new brush shape or a new colour that the speed aspect becomes a problem. It takes a good three seconds to change brush shape, and even colour

change isn't instantaneous. This rapidly becomes annoying for an adult, and a child would very quickly get extremely frustrated, I suspect, if the program didn't do exactly what it wanted, exactly when it wanted it. Then there's the file loading mechanism. Not for *KidsPaint* a nice Requester which enables the user to click on the required file. Instead, you are given a list of pictures in the current directory, and asked to type in the name of the one that you want. Again, fine – although annoying – for an adult, but a child just learning its way around the keyboard simply wouldn't be able to cope.

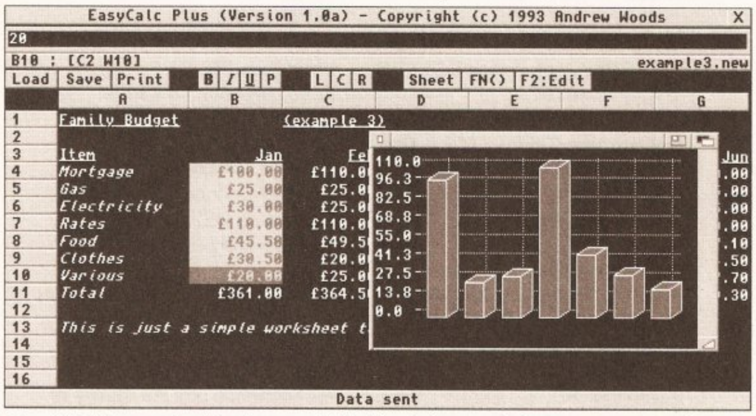
All in all, this program has a lot of promise, but it isn't quite there yet. I hope the next version will have some improvements in speed and file handling; until then, you're probably better off sticking to *DPaint*, even though it is more confusing for a child.

Program rating: 6/10

EASYCALCPLUS

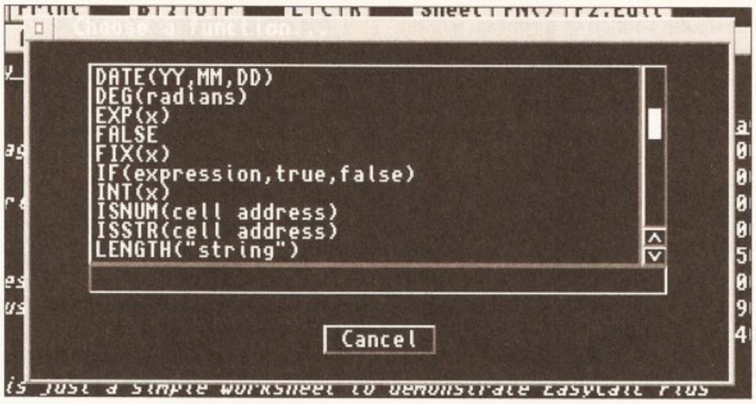
Kew=II Collection disk U1065

When I reviewed *EasyCalc* a few issues ago, I gave it 9/10 and said that it was the best shareware



EasyCalcPlus: undoubtedly one of the best pieces of shareware ever written for the Amiga. If you need an Amiga spreadsheet, forget all the others.

spreadsheet program on the market. I know, because I'm quoted as saying that in the documentation for this new version. Well, I was right at the time, but *EasyCalcPlus* blows the earlier version away – there are a range of improvements that now take it right up there with commercial



***EasyCalcPlus* has included many new features, like a "function browser" – now you don't even need to remember exactly what a function is called.**

packages on just about any platform.

The only restriction on *EasyCalcPlus* is that it now requires Workbench 2.0 or above to run – if you're still a 1.3 user, you'll have to stick with the earlier version of *EasyCalc*. But anyone using *EasyCalc* who has Workbench 2.0 or above should upgrade right now!

Some of the new features in *EasyCalcPlus* include:

- Extra maths functions (almost all the standard *Lotus 1-2-3* functions are included)
- Import and export of data
- ARexx interface
- Function browser – enables you to automatically paste in function definitions, without having to remember their exact syntax or format.
- Far better cell formatting – including dates, times, currency, percentages and so on.
- Implementation of the first "dreamlink" feature – charting. Dreamlink is a feature devised by the author, Andrew Woods, to allow him to create other modules which can "plug in" to the main spreadsheet program. *EasyChart* is the first such module, and provides the user with seven different chart types (bar, 3D bar, pie and so on) which can be created directly from the spreadsheet. If you're running *EasyChart* before you start up *EasyCalcPlus*, you'll find a new menu – **Charts** – appears. Select your data range, choose the chart that you want and it will be drawn in a new window on the screen for you.

The version supplied is a demo, so printing and saving as an IFF is disabled (it's also slightly buggy – I managed to crash it a couple of times) but I can't wait to see the finished version.

It's still incredible to me that Andrew releases *EasyCalcPlus* as a £15 shareware program – especially since he gives telephone support to all registered users. He could easily release this as a full-blown, commercial package, and indeed I'd be very surprised if a commercial software house or two hasn't already approached him. Thankfully, Andrew supports the shareware system, which means that we can all have access to his excellent programming efforts. For goodness' sake, if you use *EasyCalcPlus*, send in your shareware fee – we can't afford to have talent like Andrew's migrating to the commercial world!

It's quite simple: if you need a spreadsheet, don't even think of looking for anything else – this is, quite simply, the best there is.

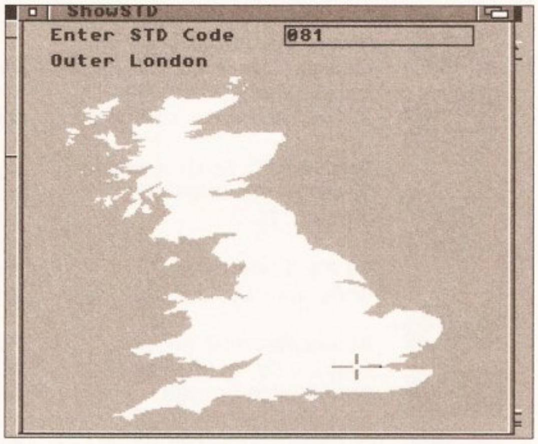
Program rating: 10/10

SCRIBBLE OFFICE

Scribble PD

This is a collection of "productivity" programs (and one or two others), compiled by Scribble PD – and a pretty decent collection it is too. The programs on the disk include:

- *Word Power*. This is more than just a spelling checker; it also solves anagrams and finds words with missing letters (good for crossword fans). It even gives you the Scrabble score for any word you enter! Although the supplied dictionary is only about 2,500 words in size, registered users of the program get an updated version with 11,500 words – and you can, of course, add your own words at any time.
- *ShowSTD*. Type in the STD dialling code and you'll immediately be told



***ShowSTD*: now you know where you're calling when you dial 081. (I wonder where 0898 is…) Impressed with that? Wait till you see the computerised FiloFax!**

WHERE TO GET IT

There are two main ways to get hold of Amiga PD and shareware: from a bulletin board or from a PD library.

The advantage of using a bulletin board (BBS) is that often the latest software is uploaded as soon as it's available. On the downside, you need a modem to connect, and you'll have to pay phone charges (and sometimes a connection fee to the BBS as well).

There is a growing number of BBSs with a wide range of Amiga software available for download. Check out 01-for Amiga (071 377 1358) and the Cheam Amiga Bulletin Board (081 644 8714). Another good option is joining CIX (the Compulink Information eXchange), which not only has Amiga software but also contains conference and file areas on a wide range of subjects. Many of the *Amiga Shopper* writers have accounts on CIX, so you can get first-hand advice on your problems, too. For more details, call CIX on 081 390 8446 (voice) or 081 390 1255 (modem).

If you don't want to use a BBS or haven't got a modem, the other way to get PD software is from a PD house. Many advertise in *Amiga Shopper*, and there's a full directory overleaf. Expect to pay between 99p and about £2.50 per disk – there's often a discount if you buy in bulk, too. As for the difference between companies which charge 99p and those which charge £2.50 – well, try both types. There are brilliant, totally professional PD houses which charge less than a quid, and total incompetents which charge more than twice that.

and shown on a map where in the country that code is.
• *CalcKey.* A simple calculator that pops up whenever a hot-key combination is pressed.
• *Organized!* A very smart-looking computer version of a FiloFax, written in AMOS (so no screengrab…) – it even looks like a real personal organiser! Unfortunately, there were no docs for this program on the disk – but it certainly looks good…
• *The Money Program.* An AMOS accounts package.
• *TicTacToe.* A Noughts-and-crosses game so stupid that you should be able to beat it every time. Well, you've got to have something to do in your lunch hour!

All in all, this is a worthwhile package of utilities – *WordPower* alone would be worth the £1 per disk that Scribble charges.

Value for money: 9/10 AS

UK PD HOUSES • UK PD HOUSES

***An asterisk by a library's name means see its advert in this issue for further details.**

A1200 Only PD. Contact B J Cowdall, 27 Pheasant Way, Cirencester, Glos. GL7 1BJ.

AMOS PD, 1 Penmynydd Road, Penlan, Swansea, SA5 7EH.

Amiganuts Unied, 12 Hinkler Road, Southampton, Hants. SO2 6FT. ☎ 0703 470017.

Amiga Productivity PD Series, 51 Ennors Road, Newquay, Cornwall TR7 1RB. Contact M J Docking.

***Anglia PDL,** 30 Victoria Street, Felixstowe, Suffolk, IP11 7EW, ☎ 0394 283494.

Armchair PD, 180 Blackton Close, Newton Aycliffe, Co Durham DL5 7EY.

Batty's PD. Contact Ian or Lynn Battison, 7 Denmark Road, Northampton NN1 5QR. ☎ 0604 22456. Life membership £3.99.

Belshaws PD. 55 Baldertongate, Newark, Notts. NG24 1EU, ☎ 0636 72503.

BG PD, 6 Peter Street, Whitehaven, Cumbria CA28 7QB.

Blitterchips, Cliffe House, Primrose Street, Keighley, BD21 4NN, ☎ 0535 667469.

Bus Stop PD. Contact Lisa or Cheryl, 6 Smiths Avenue, Marsh, Huddersfield HD3 4AN, ☎ 0484 516941.

C and C PD. Contact Chris Wildman, 3a The Cedars, Tilehurst, Reading, Berks. RG3 6JW, ☎ 0734 411131.

Chris's PD, 22 Merryfields Avenue, Hockley, Essex SS5 5AL.

Colwyn PD. Free, non-profit-making PD, membership £5 per year. Contact Andy Roberts, 17 Gladys Grove, Colwyn Bay, Clwyd LL29 7YB, ☎ 0492 533442.

Computer & Design Services, 24 Blackmoor Croft, Tile Cross, Birmingham B33 0PE. ☎ 021 779 6368

CP PD, 3 Dunedin Crescent, Winshill, Burton on Trent, Staffs. DE15 0EJ, ☎ 0283 516736.

Crazy Joe's, 145 Effingham Street, Rotherham, South Yorks, S65 1BL, ☎ 0709 829286.

Deja Vu, 7 Hollinbrook, Beech Hill, Wigan WN6 7SG, ☎ 0942 495261.

Diskovery PD, 108 The Avenue, Clayton, Bradford, West Yorkshire BD14 6SJ, ☎ 0274 880066.

Essex Computer Systems, 118 Middle Crockerford, Basildon, Essex, SS16 4JA, ☎ 0268 553963.

Eurodisk PD, PO Box 2, Radlett, Herts WD7 8QL.

***Express PD,** 47 Aberdale Road, West Knighton, Leicester LE2 6GD, ☎ 0533 887061.

George Thompson Services, Bridgegate Centre, Martinfield, Welwyn Garden City, Herts. AL7 1JG, ☎ 0707 391389.

GVB PD, 43 Badger Close, Maidenhead, Berks. SL6 2TE, ☎ 0831 649386.

Highland PD. Free list contains lots of education, business and games disks. Contact David Paulin, 255 Drumrossie Avenue, Inverness IU2 3SX ☎ 0463 242431.

Holmes Brothers Compilations. Contact Craig for monthly compilation disk. 23 Rocester Avenue, Wednesfield, Wolverhampton, West Midlands WV11 3AU. ☎ 0902 733418.

Hornesoft PD. Contact Chris Horne, 23 Stanwell Close, Wincobank, Sheffield S9 1PZ, ☎ 0742 422000.

ICPUG (Independent Commodore Product Users Group), PO Box 1309, London, N3 2UT, ☎ 081 346 0050.

Immediate Arts, 26 Lyndhurst Gardens, Glasgow G20 6QY. ☎ 041 946 5798.

Judge Dredd's PD, 1 Nottingham Road, South Croydon, Surrey CR2 6LN.

Kew=II Collection, PO Box 672, South Croydon, Surrey CR2 9YS, ☎ 081 657 1617.

***KT's PD.** 75 The Drive, Rochford, Essex SS4 1QQ, ☎ 0702 542536.

Langham PD. Contact Richard Payne, 89 Wolverhampton Road, Codsall, Wolverhampton WV8 1PL

Logic PD, 8/5 Glenalmond Court, Sighthill, Edinburgh EH11 4BE.

Magnetic Fields, PO Box 118, Preston, Lancashire PR2 2AW. ☎ 0772 881190

Mega PD, 78 Bockingham Green, Basildon, Essex SS13 1PF. ☎ 0268 559164 / 0621 828527

Mythril PD, PO Box 68, Romford RM6 6LY.

NBS, 1 Chain Lane, Newport, Isle Of Wight, PO30 5QA, ☎ 0983 529594.

Network PD & Shareware Library, Kenmare, Co. Kerry, Eire. ☎ 010 353 64 41603

***NJH Computers,** 12 Meesons Mead, Rochford, Essex SS4 1RN. ☎ 0702 546796.

Numero Uno. Contact Dillon Eyre, 21 Burstall Hill, Bridlington, N Humberside YO16 5NP, ☎ 0262 671125.

Orbital Software. Contact A Flowers, 37 The Orchard, Market Deeping, Peterborough, Cambs. PE8 8JR, ☎ 0778 342064.

Pathfinder PD, 41 Marion Street, Bingley, W Yorks. BD16 4NQ, ☎ 0274 565205.

***PD Soft,** 1 Bryant Ave, Southend-on-Sea, Essex, SS1 2YD, ☎ 0702 466933.

Riverdene PDL, 30a School Road, Tilehurst, Reading, Berkshire RG3 5AN, ☎ 0734 452416.

Roberta Smith DTP, 190 Falloden Way, Hampstead Garden Suburb, London NW11 6JE, ☎ 081 455 1626.

Scribble PD, 14 Woolner Close, Barham, Suffolk IP6 0DL

Sector 16, 160 Hollow Way, Cowley, Oxford, ☎ 0865 774472.

Seventeen Bit Software, PO Box 97, Wakefield, West Yorks WF1 1XX, ☎ 0924 366982.

Softville, 35 Market Parade, Havant, Hants PO9 1PY ☎ 0705 498199

Software Expressions, Unit 4, 44 Beauley Road, Southville, Bristol BS3 1PY, ☎ 0272 639593.

Startronics, 4 Arnold Drive, Droylsden, Manchester M35 6RE, ☎ 061 370 9115.

Tazmania PD. Contact M Hewson, 4 Boultham Avenue, Lincoln LN5 7XZ, ☎ 0522 538706 (after 6 pm).

Telescan Computer Services, Handsworth Road, Blackpool FY5 1SB, ☎ 0253 22296.

Trevan Designs Ltd, PO Box 13, Aldershot, Hants. GU12 6YX, ☎ 0483 725905 (note: modem line, not voice).

Vally PD, PO Box 15, Peterlee, Co Durham SR8 1NZ, ☎ 091 587 1195.

Virus Free PD, 31 Farringdon Road, Swindon, Wiltshire SN1 5AR ☎ 0793 512321

***Visage Computers PDL.** 18 Station Road, Ilkeston, Derbyshire DE7 5LD, ☎ 0602 444501.

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When you write to any of these libraries for a catalogue, include an SAE for its return. Some libraries ask that you send a blank disk as well.

If a library is named in a review, this means that that library provided us with the disk reviewed. Given that PD can be freely copied, the same program may well be available legitimately from several libraries.

• If you run a PD library not listed here and wish to be included, or if you want to amend any information given, send full details and a copy of your latest catalogue to:
PD Directory, *Amiga Shopper*, 30 Monmouth Street, Bath, Avon BA1 2BW.



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HARDWARE

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Welcome to the *Amiga Shopper* Buyer's Guide, your regular guide to what's hot in the Amiga market place. It's designed as a simple-to-use yet comprehensive guide which will help you to make the right buying decisions. It may not include each and every product ever produced for the Amiga (that would take up virtually the whole of *Amiga Shopper!*), but you can rest assured that all major brands and models are here. The Buyer's Guide will run each and every month and as new products are released and others discontinued, we'll be updating it accordingly. This month we bring you a guide to hardware for the Amiga owner. Next month: software.

AMIGAS

Model	Price	Memory	Total Chip	Total Fast	Processor	Speed (MHz)	Hard Disk (Mb)	Floppies	Comment
A500 Plus	£199	1 Mb	2 Mb	9Mb	68000	7	No	1x880k	Discontinued, but still available from retail outlets
A600	£199	1 Mb	2 Mb	4 Mb	68000	7	No	1x880k	Replacement for now-discontinued A500 Plus
A600HD	£269	1 Mb	2 Mb	4 Mb	68000	7	20	1x880k	A600 with built-in 20Mb IDE
A3000	£1,300	2 Mb	2 Mb	16 Mb	68030	16/25	50/100	1x880k	Available in several hard disk/processor configurations
A1200	£299	2 Mb	2 Mb	8 Mb	68020	14.2	No	1x880k	Latest Amiga fitted with AGA
A4000-030	£999	2 Mb	2 Mb	16 Mb	68030	25	80/120	1x1.76Mb	Successor to the A1500/A2000
A4000-040	£2,000	6 Mb	2 Mb	16 Mb	68040	25	120	1x1.76	Flagship of Amiga range

HARD DRIVES

Model	Supplier	Price	Machine	Capacity (Mb)	RAM Expansion	Rating	Issue
500XP	Surface UK	£489	A500	40	2/8 Mb	****	1,2,8,13
A2091-40	Commodore	£200	A1500→	40	–	**	8,13
A590	Commodore	£399	A500	20	2 Mb	***	1,2,8,13
DataFlyer2000	Trilogic	£350	A1500→	48	–	***	1,2
DataFlyer500	Trilogic	£350	A500	48	–	**	1,2,8,13
FastTrak	Third Coast	£599	A500	40	–	***	8
Impact II+	Silica	£399	A500	50/110	8 Mb	*****	1,2,8,13
Impact IIHC+8	Silica	£299	A1500→	40-300	8 Mb	****	1,2,13
Nexus HC	Power Computing	£350	A1500→	40	8 Mb	****	8,13
Novia 30i	Power Computing	£399	A500	20/30	–	***	8
OpticalDrive	Power Computing	£1,199	SCSI	128	–	N/A	–
Prima	Power Computing	£499	A500	50/100	–	****	8
Protar HD	Protar	£299	A500	20	8 Mb	N/A	–
RocHard	Zye Technology	£379	A500	52	8 Mb	****	13
SysQuest	Omega Projects	£690	SCSI	88	–	****	8
TapeStreamer	Omega Projects	£600	SCSI	150	–	N/A	–
Trumpcard	Third Coast	£399	A500*	40	–	***	8
WordSync2000	Surface UK	£450	A1500→	52	–	****	1,13

Note: Trumpcard can be used on both A500 and A1500

EXTERNAL DRIVES

Model	Supplier	Price	Machine	Size	Capacity	Disable Switch	Rating	Issue
3A-1D	Golden Image	£65	Any	3.5 inch	880K	Yes	****	0,8
A1011	Commodore	£100	Any	3.5 inch	880K	No	***	0,1,2,8
AEHD	Applied Engineering	£140	Any	3.5 inch	1.52 Mb	No	*****	8
CAX354	Cumana	£75	Any	3.5 inch	880K	Yes	****	0,1,2,8
DualDrive	Power Computing	£120	Any	3.5 inch	2x880K	Yes	****	0,1,2,8
Floptical Disk	Digital Micronics	£650	Any	3.5 inch	20 Mb	Yes	*****	8
Internal2000	Power Computing	£50	A1500→	3.5 inch	880K	No	****	8
PC880B	Power Computing	£55	Any	3.5 inch	880K	Yes	*****	8
RF332C	Silica Systems	£60	Any	3.5 inch	880K	Yes	****	0,1,2,8
RF542C	Silica Systems	£80	Any	5.25 inch	880K	Yes	****	0,1,2,8
XL Drive	Power Computing	£99.95	Any	3.5 inch	1.76 Mb	Yes	*****	29
Zydec	Evesham Micros	£55	Any	3.5 inch	880K	Yes	***	8

***Note:* PC880B comes with built-in disk copier. Enquire about availability of the Floptical Disk.**

RAM EXPANSIONS

Model	Supplier	Price	Machine	Size	Max Size	Power Supply?	Fitting	Rating	Issue
500RX	Surface UK	£198	A500	2 Mb	8 Mb	Optional	Expansion Bus	*****	5
A2058	Commodore	£150	A1500→	2 Mb	8 Mb	No	Zorro	****	24
AD501	Ashcom	£21	A500	512K	512K	No	TrapDoor	*****	24
AX601	Ashcom	£45	A600	1 Mb	1 Mb	No	TrapDoor	****	24
AdRAM2000	Power Computing	£179	A1500→	2 Mb	8 Mb	No	Card	****	8
Addax	Ashcom	£125	A500	2 Mb	8 Mb	No	Expan Bus	****	24
AmiTek600	Silica Systems	£45	A600	1 Mb	1 Mb	No	TrapDoor	****	24
Aries2000	Power Computing	£129	A1500→	2 Mb	8 Mb	No	Zorro	*****	24
Ashcom1.8Mb	Ashcom	£155	A500	1.8 Mb	–	No	TrapDoor	N/A	–
Ashcom512k	Ashcom	£35	A500	512k	–	No	TrapDoor	****	8
GVP Series2	Silica	£159	A1500→	2 Mb	8 Mb	No	Card	N/A	–
PC501	Power Computing	£30	A500	512K	512K	No	TrapDoor	****	24
PC501+	Power Computing	£36	A500 Plus	1 Mb	1 Mb	No	TrapDoor	*****	24
PC601	Power Computing	£40	A600	1 Mb	1 Mb	No	TrapDoor	*****	24
Power 8 Mb	Power Computing	£109	A500	2 Mb	8 Mb	No	Expan Bus	*****	24
ProAgnus	WTS Electronics	£139	A500/2000	1 Mb	Chip Ram Exp	No	Internal	****	24
ProRAM Plus	Datel	£25	A500	512k	–	No	TrapDoor	***	8
ProRAM501	WTS Electronics	£19	A500	512K	512K	No	TrapDoor	****	24
ProRAM601	WTS Electronics	£38	A600	1 Mb	1 Mb	No	TrapDoor	*****	24
RAM-Master 2	Datel	£100	A500	1.5 Mb	–	No	TrapDoor	N/A	–
V2000	Virgo	£104	A500	2 Mb	–	No	TrapDoor	N/A	–
Zydec1.5	Zydec	£79	A500	1.5 Mb	–	No	TrapDoor	N/A	–
HD8+	Silica Systems	£150	A150→	0 Mb	8 Mb	No	Zorro	*****	24

PROCESSOR ACCELERATORS

Model	Supplier	Price	Machine	Processor	Speed	Max 32-bit RAM	Maths Co-pro	Rating	Issue
040/500	Power Computing	£725	A500	68040	28 MHz	8 Mb	68882	*****	14
2000/40	Marcam	£1,937	A1500→	68040	50 MHz	32 Mb	Yes	N/A	–
38 Special	Omega Projects	£850	Any	68030	38 MHz	8 Mb	68881	****	13

PRODUCT LOCATOR

40/4 Magnum	Omega Projects	£NA	A1500→	68040	28 MHz	16 Mb	68882	*****	13
A1230	Silica	£299	A1200	68030	40 MHz	32 Mb	68882	*****	27
A2630	Commodore	£1,200	A1500→	68030	25 MHz	4 Mb	Yes	N/A	–
A3001	Silica	£1,799	A1500→	68030	50 MHz	32 Mb	Yes	*****	3,5
A5000-16	ACL	£189.99	A500, A500 Plus	68020	16 MHz	4 Mb	68881	N/A	4
A530	GVP/Silica	£800	A500	68030	40MHz	8 Mb	68882	*****	20
AdSpeed	Silica	£173	A500	68000-16	16 MHz	–	No	****	3,5
B5000-25	ACL	£479	A500	68030	25 MHz	8 Mb	68882	****	3,5
CBM 040 Card	Commodore	£NA	A3000	68040	40MHz	NA	Yes	*****	20
CSA MegaMidget	Omega Projects	£389	A500	68030	33 MHz	8 Mb	Yes	****	3,5
CSA Rocket Launcher	Omega Projects	£549	A1500	68030	50MHz	–	68882	*****	20
FusionForty	Power Computing	£1,999	A1500→	68040	50 MHz	32 Mb	Yes	N/A	–
G-Force	Silica	£1,999	A3000	68040	28 MHz	–	–	N/A	–
G-Force	Silica	£599	A1500	68030	25 MHz	16 Mb	68881	****	15
G-Force 030	Silica	£699	A1500	68030	40 MHz	4 Mb	68882	****	27
M1230XA	Indi Direct	£299	A1200	68030	50MHz	128 Mb	68882	****	29
Mercury	Power Computing	£1,249	A3000	68040	28 MHz	32 Mb	68882	*****	14
VXL-30	ZCL Ltd	£409	A500	68030	25 MHz	8 Mb	Yes	N/A	–
Zeus	Power Computing	£1,449	A1500→	68040	28 MHz	64 Mb	68882	*****	14

Note: Although some 68030 cards appear to run faster than their '040 equivalents, this may not necessarily be the case. All '040 cards will run faster internally.

SCANNERS

Model	Supplier	Price	Machine	Type	Colour	Resolution	Rating	Issue
AlfaScan	Golden Image	£199	Any	Hand Held	No	400dpi	*****	14, 22
DaataScan 2GS	Pandaal	£125	Any	Hand Held	No	400dpi	***	14, 22
GT-6000	Epson UK	£1300	Any	Flatbed	Yes	600dpi	*****	17
GeniScan	Datel	£130	Any	Hand Held	No	400dpi	N/A	–
GoldenImage	GoldenImage	£150	Any	Hand Held	No	400dpi	*****	5
Handy Scanner	Pandaal	£140	Any	Hand Held	No	400dpi	***	14
Pandaal Scanner	Pandaal	£180	Any	Hand Held	No	400dpi	****	3
Power Scanner 2	Power Computing	£99	Any	Hand Held	No	400dpi	*****	14
Powerscan Colour	Power Computing	£239	Any	Hand Held	Yes	400dpi	***	23
Sharp JX-100	Silica	£695	Any	Hand Held	Yes	200dpi	N/A	–
Sharp JX-300	Silica	£3600	Any	FlatBed	Yes	300dpi	N/A	–

DIGITISERS

Model	Supplier	Price	Realtime	Colour	Realtime Colour	Animation	Rating	Issue
ColourPic	JCL	£399	Yes	Yes	Yes	No	****	2
ColourPic Plus	JCL	£699	Yes	Yes	Yes	Yes	****	22
DigiTiger II	SA&H	£200	No	Yes	No	No	****	17
DigiView 4	Silica	£150	No	Yes	No	No	N/A	–
FrameGrabber	Marcam	£599	Yes	Yes	Yes	Yes	N/A	–
V-Lab	ACS	£300	Yes	Yes	Yes	No	****	17
VideoDigitiser	Datel	£80	Yes	Yes	No	No	N/A	–
VideoMaster	MicroDeal	£69.95	Yes	Yes	No	Yes	****	25
Videon	Power Computing	£200	No	Yes	No	No	N/A	–
Vidi-Amiga 12 AGA	Rombo	£99.95	Yes	Yes	No	Yes	*****	22

SOUND SAMPLERS

Model	Supplier	Price	Stereo	Volume Adjust	Resolution	Rating	Issue
AD1012	HB Marketing	£399	Yes	Yes	12-bit	N/A	–
AD1016	HB Marketing	£TBA	Yes	Yes	16-bit	N/A	–
AMAS 2	MicroDeal	£100	Yes	Yes	8-bit	N/A	–
Audio Engineer	HB Marketing	£199	Yes	Yes	8-bit	*****	5
Audition 4	HB Marketing	£49	Yes	Yes	8-bit	****	10
Clarity 16	MicroDeal	£149.95	Yes	Yes	16-bit	****	25
GVP DSS	Silica	£60	Yes	Yes	8-bit	****	3
Megamix Master	Rombo	£39.95	Yes	Yes	8-bit	N/A	–
MicroSampler	Datel	£25	Yes	No	8-bit	N/A	–
Perfect Sound 3	HB Marketing	£60	Yes	Yes	8-bit	***	10
SampleStudio 2	Datel	£70	Yes	No	8-bit	N/A	–
Sound Master	HB Marketing	£130	Yes	Yes	8-bit	N/A	–
SoundTrap 3	Omega Projects	£30	No	No	8-bit	****	3
StereoMaster	MicroDeal	£40	Yes	Yes	8-bit	****	11
StereoSampler2	Trilogic	£40	Yes	Yes	8-bit	N/A	–
TechnoSound	New Dimensions	£35	Yes	No	8-bit	****	5

***Note:* AD1012 and AD1016 are for A1500→ only**

GENLOCKS

Model	Supplier	Price	Fade	Dissolve	S-VHS	RGB Pass thru	Rating	Issue
8802 FMC	Marcam	£178	Yes	No	No	Yes	N/A	–
A8802	Marcam	£139	No	No	No	Yes	N/A	–
A8802S-VHS	Marcam	£499	Yes	Yes	Yes	Yes	***	10
A8806	Marcam	£499	No	No	No	Yes	N/A	–
GST Gold	Third Coast	£550	Yes	Yes	Yes	Yes	N/A	–
GeneSys	G-2 Systems	£934	Yes	Yes	Yes	Yes	****	29
Hama 290	Hama PVAC	£749	Yes	Yes	Yes	Yes	****	16
ImageMaster	Neriki	£1,150	Yes	Yes	Yes	Yes	N/A	–
MicroGen	Power Computing	£199	Yes	Yes	No	Yes	N/A	–
MiniGen	ASAP	£99	No	No	No	No	N/A	–
ProGen	Gordon Harwood	£130	No	No	No	Yes	N/A	–
RocGen	Silica	£117	Yes	Yes	No	No	****	8
RocGen+	Silica	£199	Yes	Yes	No	Yes	****	10
VideoCentre2	G2	£1,170	Yes	Yes	Yes	Yes	N/A	–
VideoCentre3	G2	£1,999	Yes	Yes	Yes	Yes	****	7

PRODUCT LOCATOR

HARDWARE

VideoMaster VM-2	**Power Computing**	**£799**	**Yes**	**Yes**	**Yes**	**Yes**	***	**1**
Videocomp G-100	Silica	£1,800	Yes	Yes	Yes	Yes	*****	3

COLOUR CARDS

Model	Supplier	Machine	Price	Type	Colour Palette	Max Resolution	Rating	Issue
AVideo 12	Checkmate	A1500→	£299	12-bit	12-bit	768x580	***	13
AVideo 24	**Checkmate**	**A1500→**	**£599**	**24-bit**	**24-bit**	**768x580**	*****	**15**
DCTV	Silica	A500	£499	Pseudo	24-bit	368x580	****	12
GVP IV-24	**Silica**	**A1500→**	**£1,799**	**24-bit**	**24-bit**	**910x576**	****	**12**
Harlequin	ACS	A1500→	£1,400	24-bit	24-bit	910x576	*****	11
OpalVision	**Micro-PACE**	**A1500→**	**£899**	**24-bit**	**24-bit**	**768x580**	*****	**20**
Rembrandt	Power Computing	A1500→	£1,499	24-bit	24-bit	1024x1024	****	13
Retina	**ACS**	**A1500→**	**£345**	**24-bit**	**24-bit**	**2400x1200**	****	**27**

Note: A500 devices can be used on all Amigas

TOUCH TABLETS

Model	Supplier	Price	Size	Resolution	Rating	Issue
Cherry Mk4	Cherry	£450	9x12"	*****	N/A	–
Genitizer	**Datel**	**£130**	**9x6"**	****	**N/A**	**–**
Podstat PT-3030	HB Marketing	£179	9x12"	*****	N/A	–

DOT MATRIX PRINTERS

Model	Supplier	Price	Pins	Speed(CPS)	Fonts	Buffer	Rating	Issue
200	Citizen	£250	24	240	7	8K	N/A	–
240C	**Citizen**	**£350**	**24 (colour)**	**240**	**9**	**8K**	**N/A**	**–**
L24d	Citizen	£292	24	109	3	8K	****	4
LC200	**Star**	**£304**	**24**	**91**	**4**	**16K**	****	**4**
LC24	Star	£304	24	130	5	16K	****	4
LQ400	**Epson**	**£269**	**24**	**121**	**3**	**8K**	****	**4**
LQ550	Epson	£375	9	109	4	8K	***	4
LX850	**Epson**	**£269**	**9/24**	**106**	**3**	**4K**	***	**4**
ML380	Oki	£386	24	127	3	8K	****	4
P20	**NEC**	**£351**	**24**	**115**	**8**	**8K**	****	**4**
Swift 24	Citizen	£428	24	121	5	8K	****	4
Swift 9	**Citizen**	**£280**	**9**	**121**	**3**	**8K**	*****	**4**
Swift 90C	Citizen	£169	9	216	6	8K	****	29

INKJET PRINTERS

Model	Supplier	Price	Nozzles	Speed CPS	Fonts	Resolution	Rating	Issue
B100	Fujitsu	£349	48	160	3	300dpi	****	22
B200	**Fujitsu**	**£499**	**48**	**180**	**3**	**300dpi**	***	**22**
BJ-10ex	Canon	£299	64	83	4	360dpi	*****	22
BJ-10sx	**Canon**	**£227**	**64**	**110**	**3**	**360dpi**	****	**29**
BJ300	Canon	£495	64	300	3	360dpi	****	22
Diconix 701	**Kodak**	**£399**	**48**	**200**	**3**	**300dpi**	***	**22**
Projet	Citizen	£496	48	360	3	360dpi	****	22
SQ870	**Epson**	**£659**	**48**	**360**	**8**	**360dpi**	****	**22**
Stylus 800	Epson	£295	48	360	8	360dpi	***	29

LASER PRINTERS

Model	Supplier	Price	Memory	Speed (pgs per min)	Fonts	Resolution	Rating	Issue
EPL4000	Epson	£799	512K–5.5Mb	6	2	300dpi	****	22
LBP-4 Plus	**Canon**	**£1,175**	**512K–2.5Mb**	**5**	**5**	**300dpi**	****	**22**
Laser 4	Star	£1,173	1Mb–5Mb	4	4	300dpi	****	22
OL400	**Oki**	**£549**	**512K–2Mb**	**4**	**4**	**300dpi**	*****	**22**
Ricoh LP1200	Silica	£820	2Mb–4Mb	6	6	400dpi	*****	22

MISCELLANEOUS HARDWARE

Model	Supplier	Price	Type	Rating	Issue
Emplant	BlitterSoft	£254.95	Macintosh Emulator	****	28
GlareGuard	**GND Distribution`**	**£86.25**	**Screen filter**	****	**26**
Golden Gate	Silica Systems	£N/A	25MHz 80386 PC Emulator for Amiga 1500+	N/A	–
I/O Port	**SwitchSoft**	**£28**	**Electronics Projects kit**	****	**17**
ICD KickBack	Silica Systems	£27	Keyboard switchable ROM sharer	N/A	–
Kickswitch	**Omega Projects**	**£25**	**Keyboard switchable ROM sharer**	**N/A**	**–**
Opto Mouse	Gasteiner	£14.95	High resolution mouse	****	28
Realt-time clock	**First Choice**	**£17.99**	**A1200 real-time clock**	****	**29**
RocKey	Silica Systems	£350	Chromakey for RocGen Plus genlock	****	19
Sound Enhancer	**Omega Projects**	**£40**	**Improved Amiga sound capabilities**	**N/A**	**–**
Toshiba CD-ROM	**Almathera**	**£499**	**CD-ROM drive**	****	**27**

If your company has a product which you think deserves to appear in the *Amiga Shopper Product Locator*, please write to us at the usual editorial address with full details.

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ACL	0933 650677
Almathera	081 683 6418
App. Engineering	0101 214 241 6060
ASAP	0724280222
Ashcom	0530 411485
Checkmate Digital Ltd	071 923 0658
Citizen	0895 72621
Commodore	0628 770088
Cortex	051 236 0480
Cumana	0483 503121
Datel Electronics	0782 744707
Digital Micronics	0101 619 431 8301
Epson UK	0442 61144
Evesham Micros	0386 765500
G2 Video Systems	0252 737151
Gasteiner	081 365 1151
GND Distribution	081 885 5512
Golden Image	081 518 7373
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HB Marketing	0753 686000
JCL Business Systems	0892 518181
Marcam Ltd	0604 790466
MicroDeal	0726 68020
Naksha UK	0925 56398
NEC	081 993 9831
Neriki	081 900 1866
New Dimensions	0291 690933
Oki	0753 31292
Omega Projects	0942 682206
Pandaal Marketing	0234 855666
Power Computing	0234 273000
Protar	0923 54133
Rombo	0506 414631
SA & H	010 40 0511 551701
Silica Systems	081 309 1111
SMG	0274 562999
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Switchsoft	0325 464423
Third Coast Technologies	0257472444
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WTS Electronics	0582 491949
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BUYING ADVICE FOR SHOPPERS

Whether you're buying over the phone or at a local store, here's our advice on getting what you want.

BUYING IN PERSON

• Where possible, always test any software and hardware in the shop before taking it home, to make sure that everything works properly.
• Make sure you have all the necessary leads, manuals or other accessories you should have.
• Don't forget to keep your receipt.

BUYING BY PHONE

• Be as clear as possible when stating what you want to buy. Make sure you confirm all the technical details of what you are buying. Some things to bear in mind are version numbers, memory requirements, other required hardware or software and compatibility with your particular model of Amiga (that is, make sure you know which version of Kickstart you have).
• Check the price you are asked to pay, and make sure that it's the same as the price advertised.
• Check that what you are ordering is actually in stock.
• Check when and how the article will be delivered, and that any extra charges are as stated on the advert.
• Make a note of the date and time when you order the product.

BUYING BY POST

As with buying by phone, you should clearly state exactly what it is you are buying, at what price (refer to the magazine, page and issue number where it's advertised) and give any relevant information about your system set-up where necessary. You should also make sure you keep copies of all correspondence both to and from the company concerned.

MAKING RETURNS

Whichever method you use to buy, you are entitled to return a product if it fails to meet any one of the following three criteria:

❶ The goods must be of "merchantable quality".
❷ They must be "as described".
❸ They must be fit for the purpose for which they were sold or for the purpose you specified when ordering.

If they fail to satisfy any or all of the criteria, then you are then entitled to:
• Return them for a refund.
• Receive compensation for part of the value.
• Get a replacement or free repair.

When returning anything, ensure that you have proof of purchase and that you return the item as soon as possible after receiving it. For this reason it is important that you check as soon as it is delivered to make sure everything you ordered is there and works as it is supposed to.

HOW TO PAY

Paying by credit card is the most sensible way, whether buying in person, by post or on the phone, because you may be able to claim your money back from the credit card company even if the firm you ordered from has gone bust or refuses to help sort out your problem.

Otherwise, you should pay by crossed cheque or postal order – never send coins or notes through the mail.

GETTING REPAIRS

Always check the conditions of the guarantee, and servicing and replacement policy, so that you know what level of support to expect. Always fill in and return warranty cards as soon as possible, and make sure that you are aware of all the conditions contained in the guarantee.

BUYING PD

Even though PD software is relatively inexpensive, you should still apply the guidelines set out above, making sure that you confirm all orders as clearly as possible.

Shopping around is still important when buying PD because different sources charge different prices for the same disks. There is no set pricing structure for disks, but bear in mind that PD houses are, in theory, supposed to be non-profit-making operations. AS

BUYING BY MAIL

• Before you send any money, ring the supplier to confirm that the item you want is in stock and when the delivery is likely to be made. Enquire about returning unwanted goods and the supplier's refund policy. Find out about hidden extras like postage and packing charges, and whether the prices quoted include VAT.

• Beware of companies that do not include an address in their adverts.

• If ordering goods of more than £100 in total value, always try to use a credit card – if anything goes wrong, you will be legally entitled to claim against the credit card company, even if the retailer has gone bust. You may also get extra insurance – check with the credit card company.

• Always buy from the most recent issue of *Amiga Shopper.*

• When your order arrives, check everything carefully. If anything is missing, don't use the product at all – contact the supplier immediately. If something doesn't work, make the obvious checks such as the fuse, but don't try to fix the product.

• If a problem does arise, contact the supplier in the first instance and calmly and politely explain your problem. In most cases these things are merely a mix-up or a misunderstanding that the supplier will happily put right. If you think you have a genuine grievance that has not been resolved, you might consider contacting your local Trading Standards Officer (the number will be in the phone directory – check the local council listing).

• Always keep records of correspondence with any mail order company you deal with and also make a note of where and when you saw the product advertised. False or misleading advertising is an offence, and suppliers must stick to what they've said in adverts.

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IN NEXT MONTH'S ISSUE

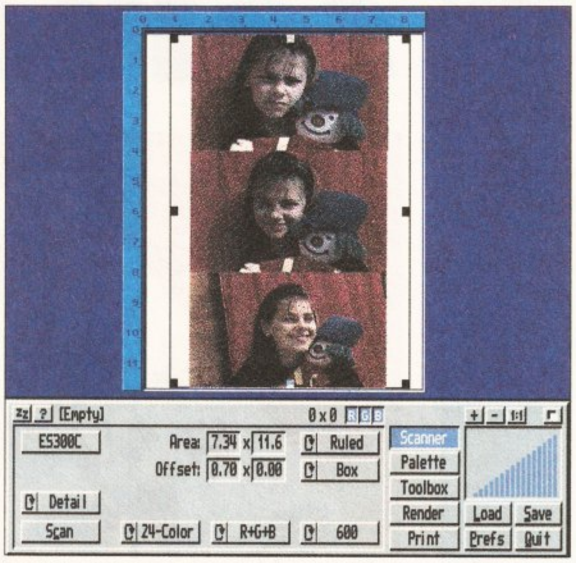
Post-modernism, next month. The free interchange of information, possibilities of endless replication of valuables, the power of the picture and the weight of words, the hum of electricity, the transfer of infinitesemal binary digits left, right, up, down, in and indeed out, the juxtaposition of samples from a wealth of culture creating collages of unparalleled complexity, the "out of memory" error message.

Yes, I'm talking about scanners. With them you can hoover up just about any image from the real world and play with it to your heart's (or mind's, if you're that way inclined) content.

You're not just limited to pictures, either. If you wish you can scan in pages of text, and today's technology will read it, interpret it and put it in a form ready for importation into a text editor, word processor or desktop publishing package. Never quite got the hang of typing? Never mind – now you don't need to.

We'll be taking a look at three colour hand scanners – the Alpha Color, the ColorBurst and Power Computing's model. In addition, we'll be taking a look at Epson's GT-6500, a 24-bit colour A4 flatbed scanner aimed at those who really mean business.

As well as the hardware, we'll be putting the software for each package through its paces, with a special look at four programs' support for the Epson: Power's bundled software, *ImageMaster*, an *Art Department Professional* module, and *ImageFX*.



Learn how best to scan insanely cute images, and which is the best equipment to use, in next month's issue.

We'll also be examining Optical Character Recognition Software, and providing lots of lovely hints to help you improve your scans.

Naturally all our usual tutorial columns will be there, along with a generous helping of Amiga Answers, and we'll be reviewing the *Brilliance* paint package, Commodore's 1942 monitor, the *Resource* disassembler and *Macro 68* assembler.

Amiga Shopper 32 – the Scanners Special – goes on sale on 2 November. It won't make your head explode, but it might just blow your mind. AS

WIN A YEAR'S FREE SUBSCRIPTION

What was the first name of the character Colonel Korn in Joseph Heller's *Catch 22*? Send your answers to "It wasn't Yo-Yo", *Amiga Shopper*, 29 Monmouth Street, Bath BA1 2DL. The closing date is Tuesday 12 October. The first correct answer wins.

Last month's winner was M Wankowski of Putney in London. Congratulations.

YOU'VE WON!

The three lucky winners of the *Crayon Wielders* competition from our September issue were: Mark Reilly of East Calder in West Lothian; John Mitchell, who hails from Billingham in Cleveland, and Geoff Hackworth, a resident of Ruddington in Nottinghamshire. Each of the chaps gets to collect a copy of the latest version of *Art Department Professional* – courtesy of those nice American people ASDG who produce the package.

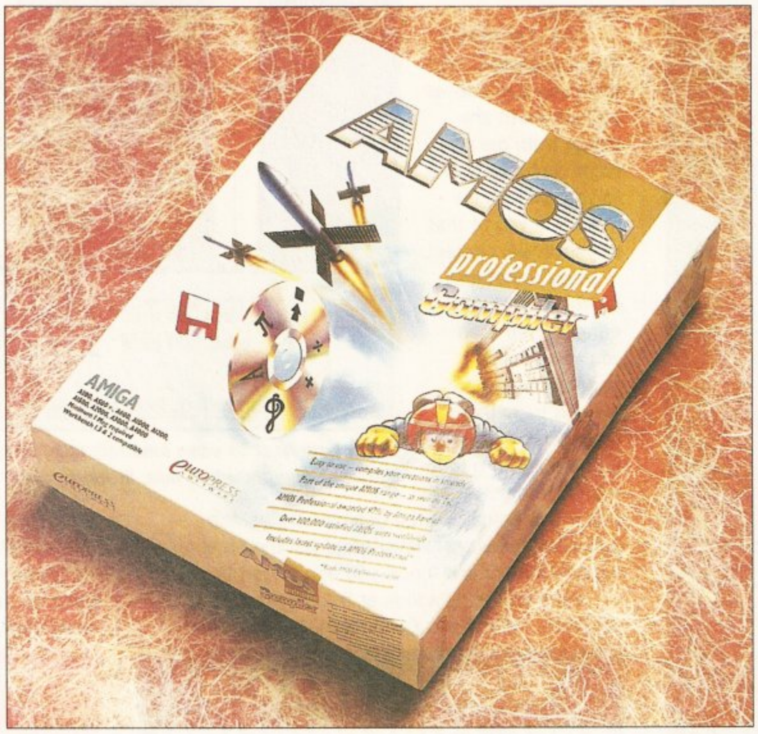
AMIGA SHOPPER AT-A-GLANCE GUIDE

To help you find what you want quickly and easily, here is a cross-referenced list of all the products and subjects covered in this month's *Amiga Shopper*. You'll find a detailed index to the many subjects dealt with in this issue's huge problem-solving *Amiga Answers* special on page 16. The page numbers given are for the first page of the article in which the subject is mentioned.

Are there any products or subjects you'd like us to take a look at? Well, just drop a line to:
***Amiga Shopper*,**
30 Monmouth Street,
Bath, Avon BA1 2BW.

WIN • WIN • WIN • WIN • WIN • WIN

Score yourself some speed!



Win Europress Software's AMOS Pro Compiler, worth £35 – it can make your AMOS programs run up to nine times faster, or more!

AMOS programmers will be dead chuffed with this month's fabulous competition bonanza – we've got ten copies of the outstanding new AMOS Pro Compiler package to be won – courtesy of those nice people at Europress Software in sunny Macclesfield.

Last month we put the compiler through its paces – and our reviewer, Gus Chandler, though it was the bee's knees and a powerful addition to the AMOS owner's armoury. The compiler really does make your programs zoom along – our tests on integer maths based programs showed a ninefold speed improvement on average. Now that's impressive by any standard – and when you remember that interpreted AMOS programs are no slouches, it's a really outstanding performance.

A particularly attractive feature of the AMOS Pro Compiler is its simplicity of use – once you've spent a few minutes installing it on your system you can start compiling programs just by selecting the **"Compile"** command from one of the AMOS menu bars. For the more advanced user there's also the facility to invoke the compiler by a variety of other routes, enabling you to compile a directory full of programs with a single command.

Now, you could just run the compiler on code you've typed in as ASCII, but it really is easier to write AMOS code if you use AMOS, so to get the most out of this prize you'll really need to have a copy of AMOS already. However, you aren't restricted to compiling only programs written in AMOS Pro – the compiler is also quite at home with AMOS and Easy AMOS – and Europress tell us they have sold more than 100,000 copies of different versions of AMOS in the UK.

Right, you should know the drill for *Amiga Shopper* competitions by now. Simply answer the three not too brain-taxing questions in the box. Next, send your answers written on the back of a postcard (or a sealed envelope), along of course with your name and address, to:

Get some speed
Amiga Shopper
29 Monmouth Street
Bath BA1 2DL

The closing date for entries is Friday 12 November and the winners will be the first ten correct answers out of the editor's cardboard box (he can't afford a hat). Send only one entry per household and please state if you don't want your name included on a mailing list. AS

THE QUESTIONS

1. Frenchman François Lionet – creator of all things AMOS – spells his name with an accent under the letter c. What's this accent called?
(a) cedilla
(b) umlaut
(c) circumflex

2. AMOS is a greatly extended version of which well-known generic computer language?
(a) C
(b) BASIC
(c) LISP

3. Europress Software are based in which town?
(a) Macclesfield
(b) Manchester
(c) Milton Keynes

WIN • WIN • WIN • WIN • WIN • WIN